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ABSTRACT

Designed as a resource for individuals who plan, manage, support, and use information technology (IT) in community colleges, this paper presents a model for strategic planning, termed the "Learning Action Plan" model. Section 1 provides an introduction to strategic planning and the Learning Action Plan model. Section 2 describes the Learning Action Plan for information technologies strategic planning, which is conceived as an ongoing process of alignment, shared vision, strategic principles, IT organizational structure, and process reengineering, operating within a context defined by the organizational culture, customer communities, and current technology base. Section 3 suggests strategies for developing a Learning Action Plan within the IT organization at a community college, along with examples of some community colleges' implementation of this new planning process. This section covers: (1) identifying organizational cultures and determining strategies based on culture types; (2) identifying customer communities; (3) identifying the current technology level of the organization; (4) identifying key organizational goals for alignment; (5) developing and communicating a shared vision; (6) developing strategic principles; (7) dealing with organizational structure issues; (8) identifying and prioritizing processes for reengineering; and (9) developing processes for continuous feedback for the planning processes. Appendixes include a survey on organizational culture; evaluation guidelines for institutional IT resources; sample statements of mission, values, purpose; and strategic principles and success factors. (KP)

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ED 372 803

The Learning Action Plan

A New Approach to Information Technology Planning in Community Colleges

By Jan A. Baltzer

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About the Author

Jan A. Baltzer, director of computing and communications for the Maricopa Community Colleges in Phoenix, Arizona, is responsible for coordinating all aspects of voice, data, and video communications between and among the ten Maricopa Community Colleges. Among her areas of responsibility are hardware maintenance, systems and applications programming, technical and network operations, and library technical services. She is currently serving a three-year term on the Board of Trustees for the Corporation for Research and Educational Networking, is a member of the CAUSE Professional Development Committee, and is Director of the Manager's Program of the CAUSE Management Institute. She is the past chair of the American Association of Community Colleges Instructional Telecommunications Consortium, past chair of the CAUSE Editorial Committee, and has served as a member of the national advisory boards of the National Teleconferencing Network and the Public Services Satellite Consortium.

The League/CAUSE Task Force

Jan A. Baltzer
Director, Computing and Communications
Maricopa Community Colleges
Tempe, Arizona
BALTZER@MARICOPA.BITNET

James R. Hill
Associate Vice Chancellor
Finance and Information Technology
Dallas County Community College District
Mesquite, Texas
JRH1151.DSC1@PCMAIL.DCCCD.EDU

Terri L. Johanson
Information Technology Group
Chemeketa Community College
Salem, Oregon
TJOHANSON@CHEMEK.CC.OR.US

Albert L. LeDuc
Director of Computer Services
Miami-Dade Community College
Miami, Florida
LEDUCA@FIRNVX.BITNET

Randall Lemke
Director, Extended Learning Institute
Northern Virginia Community College
Annandale, Virginia
NVLEMKR@VCCSCENT.BITNET

Bruce K. Longo
Assistant Vice President, Administrative Affairs
Monroe Community College
Rochester, New York
LONGO@SMCCVA.LIB.MONROECC.EDU

Pamela MacBrayne
Dean of Telecommunications and
Academic Development
University of Maine at Augusta
Augusta, Maine
MACB@MAINE.BITNET

Gordon G. Mathezer
Director of Information Systems
Mount Royal College
Calgary, Alberta, Canada
GMATHEZER@MTROYAL.AB.CA

Richard E. Morgan
Executive Director
Communications and Technology Center
Washington Community and Technical Colleges
Redmond, Washington
RMORGAN@CTC.CTC.EDU

Edwin D. Rennie
Director, Information Systems & Services
Sinclair Community College
Dayton, Ohio
ERENNIE@MIDAS.SINCLAIR.EDU

Gary E. Wenger
Executive Director
Computing & Information Systems
College of DuPage
Glen Ellyn, Illinois
GARY@CODVM1.BITNET

PREFACE

In 1989, the League for Innovation in the Community College published *Planning Guide for Instructional Computing*, a monograph on how to develop and implement strategic and tactical plans for instructional computing in community colleges. The monograph was a group effort, written by a dozen or so community college practitioners and edited by the League office. The monograph seemed to fill an important need, as upwards of 7,000 were printed and distributed.

In the fall of 1992, while the League was considering updating its planning guidelines document, CAUSE was immersed in an association-wide strategic planning endeavor. Among the proposals identified for pursuit by CAUSE was the development of a publication offering a model for strategic planning for information technology in community colleges. The CAUSE Board of Directors suggested this might be an appropriate project for collaboration with the League for Innovation.

CAUSE and the League found they had mutual interest in cooperating in the development of such a publication, to provide guidelines to plan not only for instructional computing, but also for administrative computing, networking, and telecommunications—in other words, institution-wide information technology resources planning.

At that time, Jan Baltzer and Ron Bleed of the Maricopa Community Colleges, a member of both CAUSE and the League, were in the process of developing and implementing a Learning Action Plan which they believed had potential as a model for other higher education institutions. Jan generously offered to spearhead the effort to develop a League/CAUSE publication, and a League/CAUSE task force was created to support the project.

The task force membership (see facing page) was broadly representative of community colleges in North America, as well as broadly representative of the types of individuals involved in information technology planning, management, and use in community colleges.

Task force members shared their ideas primarily through an "electronic roundtable" held on the Internet, operationally supported by the CAUSE office in Boulder, Colorado. The discussion was facilitated using a "mediated idea discussion and summary" technique that had been developed and previously used successfully by CAUSE member Kenneth Blythe of The Pennsylvania State University.

Through this technique, Jan presented an outline of subtopics for online discussion, then released each subtopic for discussion one at a time with a set timeframe for each round of discussion. When discussion was completed, Jan drafted a paper for review by the task force members, who then contributed documents from their own campuses to serve as examples of some of the practices encouraged by the Learning Action Plan which the group had discussed.

CAUSE, the League for Innovation in the Community College, and IBM hope this paper will be a resource for individuals who plan for, manage, support, and use information technology in community colleges. We also encourage you to share the paper with your campus leaders—executives and trustees—who want to gain familiarity with the strategic issues and major trends in the application of information technology.

Terry O'Banion
Executive Director
League for Innovation in the Community College

Jane N. Ryland
President
CAUSE

Darlene Burnett
Academic Consulting & Services
IBM Academic Information Systems

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I would like to publicly acknowledge the incredible support and contributions of a number of individuals who made it possible for this paper to be developed and written.

First of all, my gratitude goes to Ron Bleed, vice chancellor of information technologies at the Maricopa Community College District, who worked with me over the past year to develop and implement the Learning Action Plan concept at Maricopa. Ron is a tremendous leader, visionary, and colleague, and his support on this project has been absolutely invaluable.

Second, I would like to acknowledge the work of the League/CAUSE Task Force. These folks spent countless hours "online" discussing the issues that are involved with strategic planning for information technologies in the 90s. Their ideas, concerns, and suggestions, along with their contributions of examples and suggested activities, made this publication a much more robust product than it would have been if it were simply one institution's perspective on the subject.

Third, I would like to acknowledge the talented work of Bobby Sample, who is a graphic artist in the Information Technology Services division at Maricopa. Bobby is responsible for the wonderful graphics that illustrate the various processes and concepts in the paper.

Finally, my thanks go to Julia Rudy, director of publications at CAUSE, and Don Doucette, former associate director at the League and now vice chancellor for educational services and instructional technology at the Metropolitan Community Colleges, who spearheaded this project on behalf of both organizations. Their original idea for the project and their support throughout the online discussion and the actual writing of the paper were critical to its success.

Jan A. Baltzer
February 1994

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INTRODUCTION

In his book, *The Eternally Successful Organization*, Philip B. Crosby states that an organization can become eternally successful only

> ... when the employees and suppliers of an organization do things correctly on a routine basis; when customers are pleased that their needs are anticipated and met; when growth is internally generated, profitable, and planned; when change is welcomed and implemented to advantage; and when everyone enjoys working there.[1]

Unfortunately, this often does not describe higher education institutions. All too rarely do we find our employees doing things right routinely; not because they do not know how to do their jobs, but because our processes and procedures are old and need to be reengineered for the 90s. Many of our customers—our students—are becoming disgruntled and turning elsewhere for training and education that is pertinent to their needs and offered in a way that is consistent with their employment and family commitments. Growth is rarely planned for in any type of organized way. Change is seen as a negative situation which must be "managed" or "controlled," and many of our institutions have forgotten that people function best in environments which are secure and where their contributions are genuinely appreciated.

Traditional approaches to strategic planning, particularly within information technology organizations, rarely address any of these vital success issues. A new approach is needed if we are to maintain the success and momentum experienced in the 1970s and 80s. What follows is the definition of such a new approach to strategic planning for information technologies, particularly within community colleges.

The text of this paper is organized into three major sections. The first section describes, in detail, the Learning Action Plan model, a new approach to strategic planning for information technology organizations within community colleges. The second section includes strategies that may be used by individuals to develop a Learning Action Plan at their institutions, and examples of how some community colleges have incorporated portions of this new planning process. The appendices contain sample documents from those community colleges.

Edwin Rennie, director of information systems and services at Sinclair Community College and a member of the League/CAUSE Task Force, summarizes the intent of this paper and the conclusions of the task force discussions as follows:

> The new process for strategic planning outlined in this document is not an easy solution or a quick fix. There is no cookbook approach to strategic planning. Institutions embarking on this path will be challenged in all areas of resource management: financial, physical, and, even more, human resources. Pursuing this approach to planning leaves no place to hide. It is open, participatory, and demanding of mutual respect across disciplines. It is shared vision, shared principles, shared mission, shared goals and objectives, shared learning, and ongoing validation and measurement of the success of the process. Some institutions have already embarked on this path. Others, hopefully, will embark on this path as a result of these guidelines and find that the change is a positive experience for all participants.

[1] Philip B. Crosby, *The Eternally Successful Organization* (New York: Mentor, 1992), p. 13.

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THE LEARNING ACTION PLAN MODEL

In their book, *Paradigm Shift; the New Promise of Information Technology,* Don Tapscott and Art Caston describe the "Era I" information technology strategic plan as a thick document that was unlikely to have been read by anyone except its authors. It was the result of some type of planning event, focused almost entirely on internal information technology (IT) issues rather than the customer or client of the IT department, and primarily addressed the needs of the data processing department rather than the business needs of the institution or corporation for which it was written. The new era of information technology, according to Tapscott and Caston, requires a new approach to strategic planning, one that is more directly related to the business strategies of the institution and more focused on the needs of the customers. They refer to this new era plan as one of "continuous learning action."[2]

The Learning Action Plan model for information technologies strategic planning, which was developed as a result of the work done at the Maricopa Community Colleges as well as the discussions of the League/CAUSE Task Force, is visually depicted on the facing page. This model differs from the traditional strategic planning model in several ways.

First, it is not event-oriented. The arrows in the diagram and the term "continuous feedback" strongly indicate that planning, within this model, is viewed as a circular or ongoing process. Yes, there will definitely be a written document that can be shared with others within the institution, but the written document is considered to be a byproduct of the process rather than the final goal.

Second, the Learning Action Plan model asserts that all planning activities, indeed all activities within the IT department, must be considered in light of three major "contexts": organizational culture, customer communities, and current technology base. Thus, the entire planning process is seen to be housed, visually, within these "context" elements.

Third, the Learning Action Plan model contains reference to several key success elements that may not have been previously featured in traditional strategic plans: alignment, shared vision, strategic principles, the IT organizational structure, business process reengineering, and continuous feedback. Each of these elements is shown within the visual diagram in the order in which the IT organization will need to address it as the organization moves through the planning process.

Finally, and most important of all, the Learning Action Plan model does not focus on what types of hardware or software the IT organization must *buy* or *install*, as we have traditionally seen in most IT strategic plans. Rather, it focuses on what the IT organization must *do* to remain a vital and contributing part of the overall institution.

Context for the Learning Action Plan

As the discussions of the League/CAUSE Task Force unfolded, one element became very clear: while all community colleges share a common mission of providing affordable and accessible education to all individuals throughout the geographic areas they serve, not all community colleges are alike. They differ in three major areas which form the context for any type of IT strategic planning. These areas are organizational culture, customer communities, and current technology base. Any attempt to implement a new approach to strategic planning for information technologies, the group agreed, must take these three areas of context into account.

Organizational Culture

In the late 1970s a number of research studies conducted by individuals at Harvard, Stanford, MIT, and several management consulting firms revealed the importance of what became known as "corporate" or "organizational culture." Organizational culture was defined as the shared values and priorities of the organization—the ways in which individuals

[2] Don Tapscott and Art Caston, *Paradigm Shift: The New Promise of Information Technology* (New York: McGraw-Hill, Inc., 1993), pp. 189-190.

The Learning Action Plan Model

within the organization related to one another, the standards by which performance was judged, and "how things were done." Since those early research studies, several leading authors have referred to organizational culture in their writings, concluding that organizational culture is an extremely strong force in determining the organization's long-term effectiveness.[3]

There are two major reasons why it is vital for any information technology leader to know and understand the organizational culture of his or her IT organization, as well as the organizational cultures of other subgroups or units within the institution, before launching any strategic planning process.

First, the strategies for successfully developing a Learning Action Plan, as well as the strategies for successfully implementing activities resulting from the plan, may differ depending on the type of culture in place within the institution. For example, at institutions where there is a very traditional or hierarchical culture present, the IT organization may want to have top management endorse the new approach to strategic planning, then use more traditional steering committees and processes to reach the goal of developing a Learning Action Plan. In other institutions, where there is more emphasis on entrepreneurial ventures and/or less "top-down" decision-making, the IT organization may be able to work informally within the institution, seeking out individuals at all levels of the institution to participate in the development of the Learning Action Plan from a more "grass roots" level.

Second, it may even be necessary for the IT leader to set about the process of changing his or her IT organizational culture as part of the Learning Action Plan to ensure the survival and long-term effectiveness of the IT organization. In *Corporate Cultures: The Rites and Rituals of Corporate Life*, Deal and Kennedy identify five symptoms of what they term "cultural malaise" which can be signs that an organizational culture is in trouble and needs to be changed:

- *Inward focus* occurs when individuals pay more attention to internal politics and how they are perceived within the organization than they do to customer needs, external competitions, and trends in the external environment.
- *Short-term focus* occurs when the major emphasis is on short-term goals rather than sustaining long-term business effectiveness.
- *Morale problems* occur when people are chronically unhappy.
- *Fragmentation/inconsistency* occurs when people from different cultures come together and cannot see eye-to-eye on matters that need to be discussed or resolved. The result is confusion or frustration.
- *Emotional outbursts* occur when people become frightened by a culture that is weak or in trouble.[4]

If one or more of these characteristics are seen within the IT organization, the IT leader must seriously consider what strategies to use to change the culture to one which is more

[3] These include Warren Bennis and Burt Nanus, *Leaders: The Strategies for Taking Charge* (New York: Harper & Row, 1985); James A. Belasco, *Teaching the Elephant to Dance: Empowering Change in Your Organization* (New York: Crown Publishers, Inc., 1990); Rosabeth Moss Kanter, Barry Stein, and Todd Jick, *The Challenge of Organizational Change* (New York: The Free Press, 1992); Terrence Deal and Allan Kennedy, *Corporate Cultures: The Rites and Rituals of Corporate Life* (Reading, Mass.: Addison-Wesley Publishing Company, Inc., 1982); and John P. Kotter and James L. Heskett, *Corporate Culture and Performance* (New York: The Free Press, 1992).

[4] Deal and Kennedy, pp. 136-137.

positive and more adaptable to the new ways of "doing business" for IT organizations.

Despite the many authors who have used various terminology to chart organizational cultures into specific categories, there is no easy or "cookbook" method for categorizing an organization's culture. However, by looking for answers to the following questions, we can come closer to understanding the organizational cultures that are operative within our institutions.

- What is the organizational shape and structure of the institution? Is this a single-campus college, a multi-campus college, or a multi-college district? Is there one IT department where information technologies of all types are integrated managerially, or are there multiple departments to which responsibility for various types of information technologies is assigned?
- What do the organization charts look like for this institution? Is there a strong hierarchical or pyramidal structure, or are people organized into more independent work groups or teams?
- How are decisions made? Does top management make all decisions or are individual managers and staff empowered to make decisions?
- What is the relationship between management and individual employees? How are employees evaluated? How do individuals participate in achieving the overall goals of the organization?
- How is conflict resolved within the organization? Is the conflict resolution process formal or informal? Is it handled by top or middle-level management?
- How does the organization address the issue of competition? Is being on the competitive edge important? How is the competitive edge achieved?
- What is the reaction to new ideas within the organization? Are new ideas quickly acted upon or rejected? Are ideas studied by internal groups for potential implementation to the point of "analysis paralysis"?
- What is the attitude toward risk-taking? Is risk-taking encouraged or discouraged? Are there rewards or punishments for risk-taking?
- How is success rewarded? Are rewards high or low?
- What is the cost of failure? What is the likelihood of punishment and what type of punishment is meted out when mistakes are made within the organization? What are the consequences when "things don't work"?

Examining the answers to these questions—based upon observations of the IT department, of other departments within the institution, and of the institution as a whole—leads to two major conclusions. First, organizational culture is not static; it can change as a result of organizational growth, change in leadership, competition, increased regulation or deregulation, or even planned cultural change activities. Second, we will also find that organizational culture can be different within different parts of the institution.

Customer Communities

In *A Force for Change: How Leadership Differs from Management*, John P. Kotter states that

> only when managers care about the legitimate interests of stockholders do they strive to perform well economically over time, and in a competitive industry that is only possible when they take care of their customers, and in a competitive labor market, that is only possible when they take care of those who serve customers: employees.[5]

Like the business organizations referenced by Kotter, community colleges have "stockholders"; they are the taxpayers in our community, our locally elected or appointed boards of trustees, our community advisory groups, and the businesses and industries that we serve with vocational programming. We also have "customers" in the most traditional sense of the word; they are the students, credit and noncredit, who enroll at our institutions. Finally, we have employees whose major job it is to serve our customers or our students.

There are two major problems with the way community college IT organizations have typically related to the broad-based customers of our institutions. First, within the IT organization, we often feel removed from two of the three major constituencies referenced above—the stockholders and the end customers. Over the years, we have convinced ourselves that *our* customers are the human resources department, the business office, the student services departments, the admissions and records departments and, in the case of academic computing, the faculty. We have lulled ourselves into believing that if we take care of *our* customers, they will take care of *their* customers. This luxury of allowing ourselves to be one or two steps removed from two-thirds of the major constituencies of our institutions cannot continue. We in IT must more broadly define our "customer communities" as part of the process for determining the overall context within which our planning process will occur.

Second, the way in which we listen to, communicate with, and serve our more traditional customers within the institution—the human resources and business offices, the student services and admissions/records departments, the faculty, etc.—must change. We must recognize that the leadership and sponsorship role of information technology initiatives is shifting away from the IT organization and into the user community, and that the real owners and customers of technology-based systems must be identified. We must focus more on the customer/owner of technology systems rather than on the technology itself.

What does this mean for the IT leader beginning a strategic planning process?

We must determine who our customers really are.

In the literature of Total Quality Management, a customer is defined as one who (1) directly or indirectly receives the

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[5] John P. Kotter, *A Force for Change: How Leadership Differs from Management* (New York: The Free Press, 1990), p. 46.

output of our work, (2) is the reason we are in business, (3) may be internal or external, and (4) may be classified among the "vital few" or the "useful many."

Using these four criteria, we soon find that the customers of the IT organization are many, and that they extend far outside of our traditional thinking to include not just students, faculty, staff, trustees, and employers of our students, but also suppliers (e.g., hardware/software vendors), affinity organizations (e.g., neighboring colleges and universities, other community colleges, state agencies, nonprofit organizations), and our competitors (e.g., private or proprietary schools).

We must determine our customers' needs.

What do our customers need? How do they need it? When do they need it? Where do they need it? In most community college IT organizations, determining the answers to these questions has been accomplished through the use of steering committees or user groups. In many cases, these user groups have, as their sole reason for existing, the charge of making recommendations, prioritizing requests, and giving feedback to the IT organization. In some cases, these user groups consider IT issues as part of a broader, functional agenda (i.e., student services committees or faculty senate groups). In still other cases, these groups tend to be more "interest" oriented rather than "user" oriented, meeting to share information about what they are doing with certain software packages or hardware platforms.

There are several problems that arise from the existing structure of IT user groups at most community colleges. First, if we were to carefully examine the original "charge" or purpose for many of these user groups, we would probably find that they have outlived their original purpose and need to be either refocused or disbanded. Second, the large number of user groups that can be found in many institutions, combined with the lack of training provided to leaders of these groups in meeting management techniques, results in vast amounts of time spent in meetings. Finally, some of the users groups may have such a very narrow focus that their existence is counterproductive in this era of integrated functionality and technology.

To correct the problems arising from the ways we have traditionally dealt with our IT "users," and to open up communications with all of our customers so that we can truly know and understand their needs in the broadest possible sense, IT professionals must use a variety of communication methods:

- Scheduled meetings conducted with solid meeting management techniques so that benefits of meetings are maximized
- Electronic discussions using groupware and computer conferencing systems
- Positive reinforcement of key staff in other departments who have demonstrated a talent for design, testing, and implementation of IT systems and applications
- Questionnaires and customer survey instruments
- Prototyping
- Training
- Workshops
- Audio and video conferencing
- Electronic publishing
- Online access to information for customer service functions
- Electronic mail and document distribution
- Celebrations

We must establish ways to measure the success of the IT organization in the customers' eyes.

Measurement of IT organizational performance must be done by the customers based upon such criteria as the ability of IT professionals to communicate effectively and without jargon; the ability of the IT organization to work as partners with members of the new communities to solve business problems; the ability of the IT organization to add significant value to the institution's planning processes; the ability of the IT organization to understand and be supportive of new system requirements; and the ability of the IT organization to provide timely and quality support services.

We must know who the customers of our IT services are and, further, we must work toward integrating these individual groups into a "community of the whole." The Commission on the Future of Community Colleges has taken as its theme "Building Communities," and states in its final report, "The building of community in its broadest and best sense encompasses a concern for the whole, for integration and collaboration, for openness and integrity, for inclusiveness and self-renewal."[6]

The theme of the 1993 EDUCOM conference, "Creating New Communities," added to this concept of community by suggesting the ways in which information technology can contribute:

> As leaders in higher education, we have both an opportunity and a responsibility to create new definitions of community that take best advantage of leading edge technologies and bring new levels of access and new capabilities to individuals. Networks and adaptive technologies make it possible for people to communicate without geographical, physical, or temporal restrictions ... all of these technologies are changing the way we teach, learn and communicate—changing the communities in which we live and work together.[7]

When we combine the concept of "customer" with the concept of "community," a new major set of tenets on how to manage an organization is created. The boundaries that have traditionally confined the organization begin to disap-

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[6] *Building Communities, A Vision for a New Century*. A Report of the Commission on the Future of Community Colleges (Washington, D. C.: The American Association of Community and Junior Colleges, 1988), p. 7.

[7] EDUCOM '93: Crafting New Communities, Call for Proposals.

pear and the organization can reach out to secure major gains in productivity and effectiveness by working within the context of "customer communities."

Current Technology Level

According to Tapscott and Caston,

> The problem is that today's enterprises are locked into the technology of the past—isolated systems based on outmoded host computers. These systems are costly, poorly integrated, hard to maintain, and difficult to learn and use. Such system islands are also self-perpetuating as new software applications are built on the old platform. The need to address this problem is urgent, for the longer an enterprise waits, the greater are the inertia and investment in the legacy systems.[8]

As the IT leader prepares to launch a strategic planning effort, it is important for her or him to understand the current level of technology within the institution as a whole. This means answering questions such as the following:

- What is the status of the current mainframe or host computing environment? What is the age of the hardware? the software? What does it cost to maintain these systems?
- Do the current hardware and software platforms allow the delivery of the services our customers expect?
- What is the overall level of technology usage within the institution? What is the ratio of computers to staff? computers to faculty? computers to students?
- What types of hardware are on the desktops of faculty and staff within the institution? What are the primary software packages being used?
- What types of hardware can be found in the academic labs?
- What is the extent of voice, data, and video networking within the institution and to what degree are these networks integrated?
- Has the institution adopted any formal hardware, software, or networking standards?

Answers to these questions give the IT leader a global view of the technological sophistication of the institution and frame many of the issues that must be confronted in establishing strategic principles and dealing with the most appropriate IT organizational structure, both of which are discussed later in this paper.

Components of the Learning Action Plan

Once the contextual elements of organizational culture, customer communities, and current technology base have been thoroughly examined so that the IT professional clearly understands the context in which the strategic planning process will occur, the focus can shift to the six major components of the Learning Action Plan: alignment, shared vision, strategic principles, IT organizational structure, business process reengineering, and continuous feedback.

Alignment

Wayne Gretsky, all-star hockey player for the Los Angeles Kings, has been quoted as saying that his success comes from skating "to where the puck is going to be." This is an excellent management philosophy for IT managers, because our success depends on being prepared to support our institutions and their programs where they are "going to be," not where they are today. How do we know where our institutions are going? How do we make certain that we will be where they are going to be? The answer is what authors of many management texts refer to as "business alignment."

Alignment of the IT function with the overall business needs of the institution was not a problem in the early days of computing in higher education institutions. In those days, the IT function was run, primarily, as a service bureau and the IT organization had a certain mystique, hidden behind the walls of the old data processing environment. In fact, Michael Ashmore, global practice leader for information technologies at CSC Index, states,

> Five years ago, when people talked about business alignment, they usually thought the way to achieve that was to freeze the business vector and then have IS [information services] work like crazy to catch up .... Today, they realize that the key is to change the business vector, and IS can help do that."[9]

Tapscott and Caston have identified eight signs that may occur when the IT organization is not aligned with the business needs of the overall organization.

1. *Ongoing internal conflicts.* This occurs when there are ongoing internal conflicts between the IT organization and other institutional units regarding roles, responsibilities, control of systems development, and operations.

2. *Complaints about the performance of the IT function.* Complaints may focus on the slowness of the IT organization to respond to requests for new systems or for system enhancements or about excessive costs of the IT function.

3. *Lack of an enterprise-wide vision.* Where IT functions have been decentralized or distributed throughout the institution without any type of enterprise-wide coordination, there may be a lack of vision and a feeling that the institution cannot respond appropriately on issues affecting the institution as a whole.

4. *Competitive decline.* This sign can occur when the institution is unable to pull together the right mix of business and IT resources to respond to new opportunities and to deliver appropriate systems in a timely fashion.

5. *Lack of department or senior management interest in the effective use of information technology.* When this oc-

[8] Tapscott and Caston, p. 19.

[9] Scott Liebs, "We're All In This Together," in "A View from the Top," a supplement to *InformationWeek*, 26 October 1992, p. 8.

curs, there is no conflict between IT and departmental units, because such other units have no regard for or stake in the working of the IT organization. Any planning for IT development or implementation is done in a vacuum by the IT organization with little or no involvement or acknowledgment by the other units within the institution.

6. *Inappropriate or deficient skill base.* When they are not challenged by the need to meet new requirements of the overall institution, IT professionals often remain unchanged in their skill sets or knowledge.

7. *High turnover of IT professionals.* When IT professionals do not have a clear sense of direction and do not see how their careers can be advanced as part of the institution's IT organization, they may grow restless and move on to other employment.

8. *Redundancies in systems development.* When the IT function is out of touch with the remainder of the organization, "shadow systems" or other ancillary systems may be developed in different parts of the institution. This proliferation of systems development may result in redundancy of information gathering as well as unnecessary costs to the institution as a whole.[10]

To avoid the mishaps that can accompany a lack of alignment with the overall needs of the institution, the IT professional must identify the institution's "business goals" and then determine how the IT function can help to attain these goals. This means looking for documents or statements that clarify what these goals are—for example, the college mission statement, institution-wide strategic plans, the college catalog—and then developing partnerships between the IT organization and its counterparts in other divisions to determine how all parties can collectively achieve the institution's goals.

Shared Vision

In *The Fifth Discipline*, Peter Senge writes,

> If any one idea about leadership has inspired organizations for thousands of years, it's the capacity to hold a shared picture of the future we seek to create. One is hard pressed to think of any organization that has sustained some measure of greatness in the absence of goals, values, and missions that become deeply shared throughout the organization .... Where there is a genuine vision (as opposed to the all-too-familiar "vision statement"), people excel and learn, not because they are told to, but because they want to.[11]

In the development of a Learning Action Plan for the information technology organization, it is imperative that the members of the IT organization develop a "shared vision" of what they value as individuals and as members of the IT organization, and a "shared vision" of the purpose for the IT organization as a whole within the institution. This vision will be based in part on the customer communities identified for the institution, in part on the overall institutional mission and goals, and in part on the profiles of individuals within the IT organization.

Once this shared vision is developed, it must also be communicated to others throughout the institution and to members of the institution's customer communities. Deal and Kennedy assert that shared vision within an organization, when communicated throughout the organization, affects performance in three main ways. First, managers and others throughout the organization give particular attention to whatever they believe is stressed in the corporate value system. Second, employees make better decisions when guided by a shared vision of what is important to the organization or the institution. Finally, people simply work harder when they believe they are dedicated to a "common cause."[12]

Strategic Principles

As we have read in countless management texts and heard from countless management speakers, it is no longer good enough to do things right; we must also do the right things. Tapscott and Caston have stated that a useful technique for making certain that the IT organization is "doing the right thing" is to establish a set of strategic principles, with "principles" defined as

> simple direct statements that describe what is determined to be good practice. They are typically accompanied by one or more points of rationale and by a list of implications. Principles are extremely valuable because they eliminate recurring arguments and alternative evaluations regarding key planning decisions.[13]

Tapscott and Caston have identified the following five characteristics of well-designed principles:

- Each principle clearly states a fundamental belief of the organization.
- Each principle should have a counter argument.
- Principles should be simply stated and understandable to both business and IT managers.
- Principles must be rationalized using business-related factors whenever possible.
- Principles should be accompanied by statements of implications showing that the IT organization has considered the impacts that adopting the principles will have on the organization.[14]

All community colleges, regardless of size, shape, organizational culture, customer communities, or current technology levels, find themselves facing a common set of environ-

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[10] Tapscott and Caston, pp. 263-264.

[11] Peter M. Senge, *The Fifth Discipline* (New York: Doubleday, 1990), p. 9.

[12] Deal and Kennedy, p. 33.

[13] Tapscott and Caston, p. 204.

[14] Ibid., p. 242.

mental factors that impact what principles should be developed by the IT organization. These factors can be categorized as follows:

Environmental factors from which customer-oriented principles can be developed

- The needs of our customer communities are changing as more and more power is moved from the computer room to the desktop.
  - IT customers are demanding broader-based access to information and information retrieval tools.
  - IT customers are becoming more sophisticated and knowledgeable about technology and technology-related applications.
  - IT customers have the purchasing power and expertise to act independently of the IT department whenever they perceive that their needs are not being met by that department.
- Higher education institutions are under great pressure to provide high-quality customer services (student services) in a cost-efficient manner.

Environmental factors from which information management principles can be developed

- The incredible increase in the amount of information available requires us to find new ways to capture, store, and exchange information.
- The demand for broad-based access to information must be balanced with the need for ongoing security of data.
- There is an increasing need for the development of common data definitions and enterprise-wide database administration so that information can be accurately and consistently used for decision-making within the institution.
- There is an increasing demand for easier access to data.
- The way we communicate is changing, resulting in an increasing demand to have information available in a variety of formats including text, graphics, and video.

Environmental factors from which application architecture principles can be developed

- The current generation of administrative software used by the majority of community colleges is at the end of its life cycle and does not address the business problems our institutions are facing and will face in the next three to five years.
- New application development tools such as object-oriented programming now make it possible to reuse "pieces" of software applications across development projects.
- New and emerging software architecture standards must be adhered to to ensure maximum portability of applications across vendor platforms.
- New software development and software management tools must be acquired for use within the IT department to enable our institutions to maintain and develop new software applications.
- New software architectures must take into account many new media for the capture and exchange of information including multimedia, voice, video, and imaging.
- New advances in networked software may help to remove the ongoing discussions regarding decentralization vs. centralization of databases and computing resources.
- In the next few years, it will be imperative that information technology leaders strike the right balance between ongoing investment in legacy applications and investment in new client/server application development.
- The use of electronic mail and electronic data interchange (EDI) is and will increasingly be an important business strategy to support internal and external relationships.

Environmental factors from which technology architecture principles can be developed

- IT organizations must establish and adhere to appropriate technical standards while allowing for diversity of technologies based upon business and academic needs.
- Multi-platform and multi-vendor environments are a reality; strategies for installing, operating, and maintaining hardware in such environments must be developed.
- Networking at the local, regional, national, and international levels is the cornerstone of information technology in the 90s because of the efficiencies that can be gained through networked hardware/software. Institutions must address how and where networks will be installed as well as how they will be operated and maintained.
- Advances in microprocessor technology are dramatically reducing the size and cost of computing and communications technology, making the newer technology platforms more cost-effective to acquire, operate, and maintain than older, vendor-specific, or proprietary platforms.
- The traditional divisions between voice, data, and video as separate technologies are blurring with new developments that integrate these three media.
- Intrabuilding and interbuilding cable plant strategies must be designed to meet the challenges of today's and tomorrow's needs.
- Bandwidth drivers include increased use of network applications, increasing numbers of people connected to the network, more powerful desktop units, and new types of applications.
- The goal of network design in the 90s is to create networks with flexible architectures that can respond to changing requirements and technology architectures, unlike networks of the 80s which relied on proprietary and single-vendor technologies.

Environmental factors from which business and finance principles can be developed

- Community colleges must seek out new funding strategies for the acquisition, operation, maintenance, and replacement of information technology components including hardware, software, and network infrastructure.
- The economic realities of the 90s mean that the "old way" of working with computing and communication vendor companies will no longer work. The grants, major discounts, and donation programs are gone. This means community colleges in general, and IT organizations specifically, must seek out new ways of working with suppliers, affinity groups, and other organizations that are more partnership- or alliance-oriented than ever before.
- Budget constraints at most institutions mean that we must look less toward "augmentation" of resources and more toward "reallocation" of resources to do new things.
- IT managers must be able to measure IT-related projects and demonstrate the cost-effectiveness of such projects.
- The increasing number of home and portable computers may allow institutions to "pass along" part of the cost of computing to students.
- Implementation of client/server applications will cause user departments to assume a larger share of the overall computing budget from the centralized IT organization.
- The IT organization must identify which parts, if any, of its operation can be outsourced and then appropriately manage the outsourcing relationships.

Environmental factors from which people or human resource principles can be developed

- There is increasing demand for information technology-related training at all levels of the organization.
- The industrial age methods of dealing with issues such as job descriptions, job classifications, and performance management are antiquated and must be changed to match the ways in which people are now working in the information age.
- Organizational structures that worked well in the 70s and 80s, such as separate academic and administrative computing organizations or separate telecommunications and data communications organizations, may be inhibiting factors as the institution moves into the late 90s because of the ways in which such artificial boundaries have been blurred by technology development and implementation.
- Decentralization of technical staff to user departments is a growing trend in many institutions.
- Collaborative and team-oriented work projects are being encouraged and supported through developments in groupware and other team-enabling technologies.
- Skill sets required for IT professionals are changing at a rapid rate.
- Retraining of individuals within the organization is a responsibility of the institution as well as a responsibility of each individual.
- IT organizations need to develop a series of strategies to "recast" the collective skills of the staff within the organization.
- Working together in collaborative and cooperative ways appears to lead to more efficient and effective performance. IT organizations must provide and support groupware across networks to undergird these new types of working relationships.

IT Organizational Structure

The current management literature is filled with references to changes that are occurring in the management structures of today's major corporations and institutions. "Horizontal organizations," "flattening of the hierarchy," and "self-managed teams" are just some of the phrases that have become the buzzwords for organizational management in the 90s. In *The Challenge of Organizational Change*, Rosabeth Moss Kanter, Barry Stein, and Todd Jick offer this opinion:

> A universal model for organizations is developing, especially for large organizations, as a result of the changes we are seeing in the external environment. This model describes more flexible organizations, adaptable to change, with relatively few levels of formal hierarchy and loose boundaries among functions and units, sensitive and responsive to the environment, concerned with stakeholders of all sorts—employees, communities, customers, suppliers, and shareholders. These organizations empower people to take action and be entrepreneurial, reward them for contributions, and help them gain in skill and "employability."[15]

Although these authors are speaking primarily of large corporations, there are several themes that emerge from this description that pertain to IT organizations within community colleges, regardless of size: (1) the importance of organizational structure, (2) the need for loosening or removal of boundaries within the organization, and (3) the need for ongoing learning in the organization.

Organizational structure and performance

The importance of organizational structure on the overall performance of the IT department cannot be underestimated. After completing many years of research on information technology organizations, N. Dean Meyer has stated,

> Put simply: *good people in a poor organizational structure will fail, while average people in a healthy environment are likely to succeed.* Some managers may argue that

[15] Kanter, Stein, and Jick, p. 3.

> organizational structure is unimportant where good people are motivated by a culture of teamwork that leads them to think beyond their job descriptions—a culture which is often dependent on a charismatic leader. Good people and good leadership do not substitute for good organizational design. Good organizational design does not bet on above average people and their altruism, but rather enhances the performance of good people.[16]

The discussions of the League/CAUSE Task Force echoed these comments, but also noted that "good" people in a poor organizational structure—one that is not stable or where there is confusion as to departmental or individual goals and objectives—usually try to find a way to succeed. What often happens, however, is that these individuals become frustrated with the additional effort required to succeed in spite of the structure. The result is an overall decrease in collaboration and trust, and often departure of the "good people" from the IT organization.

As part of any strategic planning effort within the IT organization, the structure of the IT organization itself must be examined. David J. Ernst stated in the preface to his materials on "Organizing Principles" from the 1993 CAUSE Management Institute,

> There are many different organizational models currently in use in the field of information technology. The reasons why some succeed and some fail are related more to their ability to fit a particular institutional environment than to the conceptual elegance of the models themselves. ...The "proper organization," then, is a creature of the environment in which it lives today and will live in the future. Understanding that environment is the preeminent organizing principle.[17]

In this workshop, Ernst contended that there is "no one right way" to organize an IT department. To help participants determine the "right way" for their institutions, he led them through a series of exercises designed to help them determine the environmental factors that might affect the structure of the IT organization at their institutions. As the participants worked through these exercises, they developed a profile of their institutions and IT organizations based upon the technology currently in place within the institution, resources available, political issues, and quality management and leadership issues. A summary of this exercise can be found on page 21 as a suggested activity for dealing with organizational structure issues.

Having achieved the results of such an "institutional audit," the IT manager interested in examining how his or her organization should be restructured as part of an overall strategic planning effort must also consider general principles for structuring IT organizations. Meyer suggests that there are two major principles that should be applied to the design of any IT organization: feedback loops and requisite variety.[18]

The concept of "feedback loops" simply means that people do what you reward them for doing. Individuals within the IT department must have a clear understanding of how they *personally* "align" with the departmental mission and, therefore, with the institutional mission, and how they relate to one another. They must know what is expected of them in clear, behavioral terms and they should be adequately and appropriately rewarded for their work. Where work assignments are confusing or seem to overlap with the assignments given to other individuals or work groups, and where rewards are inconsistent with the stated goals of the individual and the department, morale will decrease and overall performance of the individual and the department will suffer.

"Requisite variety" is a Meyer theory derived from cybernetics which asserts that each individual is limited in his or her capacity to handle variety. In today's era of constantly changing technology, the theory of requisite variety means that any individual within the IT organization can only be an "expert" in one thing at a time. The corollary of this principle for IT organizational restructuring is that the IT organization must be structured, to the degree possible, so that each job only requires a single type of expertise.

There are two issues that appear to be, but are really not, at odds with the concept of requisite variety for campus IT organizations. The first is the increasing need for "generalists," or individuals within the IT organization who have a broad-based understanding of how information technologies can be used to support the goals of the institution and who can communicate and interact with various customer communities to identify business problems and to match them with various types of technology solutions. The second is the concern expressed by several of the League/CAUSE Task Force members that many community college IT departments simply do not have sufficient staffing to allow the degree of specialization that Meyer recommends. Both of these issues are valid. IT organizations do need generalists of the type described above, just as they need specialists in specific technologies. Both are required for an IT organization to be effective. Insufficient staffing within the IT organization to allow for specialization means that the IT organization must carefully examine the type of specialist expertise required for the implementation of its Learning Action Plan and then determine what elements of this specialized expertise must reside "in-house," with internal IT staff, and what expertise can be outsourced to external consultants or technology vendors.

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[16] N. Dean Meyer, *IS Structural Programming* (Ridgevield, Conn.: N. Dean Meyer and Associates, Inc., 1990), p. 2.

[17] David J. Ernst, "Organizing Principles," a workshop presented at the 1993 CAUSE Summer Management Institute, Boulder, Colorado.

[18] Meyer, pp. 6-11.

Removal of boundaries

The need for loosening or removal of boundaries within the IT organization itself, between the IT organization and other units within the institution, and between the institution and external groups, is clearly reflected in today's environment. According to Polley McClure,

> Digital technology convergence has demolished much of the basis for separately managed organizations. The missions of academic and administrative computer centers, libraries, media service units, and others have come to overlap more and more, leading to turf battles, duplication of effort, and confusion about service roles. The rivalries engendered then become active barriers to integration and significant cost sinks.[19]

In community colleges, as in most institutions of higher education, separate internal organizations have historically been established to deal with academic vs. administrative computing, or voice vs. data communications, or audio/visual services (i.e., video) vs. computing. In the past three to five years, however, technology developments that merge voice technologies with computing such as touch-tone registration or computer-based facsimile, not to mention the common network infrastructure needs of voice and data communications, have blurred the lines of responsibility for these technologies. Technology advances in the transmission of digital video across local and wide area networks have resulted in new applications for desktop video conferencing and multimedia instructional delivery. Networks and the hardware and software connected to them are "neutral" and can—and should—be used for both academic and administrative purposes. The traditional internal "boundaries" between work groups within the institution must be eliminated if we are really to implement information technologies to efficiently and cost-effectively support the institution's mission.

The connectivity of institution to institution through regional, national, and international networks has removed geographical and institutional boundaries that once limited access to information and hardware, software, and people resources. This means that we must also eliminate the artificial boundaries that inhibit the free flow of information between and among our institutions, including antiquated policies regarding information sharing and communication.

Ongoing learning

The need for ongoing learning in the organization has been best described in the writings of such authors as Peter M. Senge, whose book *The Fifth Discipline* clearly outlines the need for development of "learning organizations":

> As the world becomes more interconnected and business becomes more complex and dynamic, work must become more "learningful." It's no longer sufficient to have one person learning for the organization .... It's just not possible any longer to "figure it out" from the top, and have everyone else following the orders of the "grand strategist." The organizations that will truly excel in the future will be the organizations that discover how to tap people's commitment and capacity to learn at *all* levels of the organization.[20]

Senge describes the "learning organization" as one in which "people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together."[21]

Any strategic planning activity within the IT organization must include a discussion of how this new learning environment is to be established and carried out. Necessary skills required for IT professionals, users, and decision-makers within the organization must be identified. Programs must be designed to deliver the targeted training or education. Finally, a variety of learning mechanisms, including workshops, seminars, computer-assisted instruction, site visits, etc., must be built into the planning process.

Business Process Reengineering

In *Reengineering the Corporation*, Michael Hammer and James Champy define reengineering as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed."[22] They clarify four critical terms within this definition: "fundamental," "radical," "dramatic," and "process."

According to Hammer and Champy, when doing reengineering, individuals within an organization must ask very fundamental questions about *why* they do what they do and why they do it the *way* they do. Asking this type of very fundamental question forces people to reexamine the underlying assumptions and rules for the way they conduct business.

Reengineering is determined to be "radical" and "dramatic" because it does not mean making superficial corrections to things, but, rather, throwing away the old and redesigning processes and procedures for completely new ways of accomplishing work. Dramatic change, rather than incremental improvements, is the goal.

Finally, Hammer and Champy stipulate that the goal is to reengineer "processes," which they define as "a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer." Most business

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[19] Polley McClure, "Organizing Information Technology—Integration or Disintegration," *CAUSE/EFFECT*, Fall 1992, p. 3.

[20] Senge, p. 4.

[21] Ibid., p. 3.

[22] Michael Hammer and James Champy, *Reengineering the Corporation* (New York: HarperBusiness, 1993), p. 32.

people, they say, are not process-oriented; instead, they are too focused on specific tasks, people, or structures.[23]

Just as these authors suggest, we in community colleges need to ask some very fundamental questions about *why* we do some of the things that we do. *Why* is an advisor's signature required on a piece of paper before a student can enroll in a given course? *Why* must all registrations be taken down on paper and then entered into a computer terminal? *Why* do we have so many checks and balances in the curriculum approval process? *Why* do we ask students to fill out multiple forms with the same information and then have multiple individuals within the institution enter that data into various databases? What we may find by asking fundamental questions such as these is that many of the processes we are currently using were designed five, ten, even fifteen years ago, if they were ever "designed" at all. The "automated systems" we are dealing with today, in many cases, have perpetuated the old way of doing things.

Within the Learning Action Plan, the IT organization should include strategies and directions for helping the entire institution in the business process reengineering effort. Such an effort is mandatory before new software applications can be developed to fit the needs of our customer communities today and in the next three to five years. It is important, however, for the IT organization to realize that the IT organization itself, while a major player in the identification and facilitation of the process reengineering efforts, is *not* the owner of the major processes to be reengineered. In other words, the major "business processes" of the institution—the process of curriculum development; the process of student recruitment, advisement, registration and graduation; the process of teaching and learning; the process of purchasing and inventorying supplies, furniture, and equipment; the processes of payroll and personnel—"belong" not to IT, but to others within the institution. The IT organization is responsible for supporting these processes and, because of the incredible impact that information technology can have on how each work unit performs the tasks associated with these processes, the IT organization is in a unique position to lead the process reengineering effort within the overall institution.

Continuous Feedback

Because the new approach to strategic planning is not event-oriented, but is a process that involves input from many different sources within the organization, the need for continuous feedback and revision of the Learning Action Plan based on changes in the environment is absolutely necessary. Our environment is constantly changing as new technologies are being developed, as new sources of electronic information are being made available, and as our institutions change, themselves, to meet the ever-changing demands of our customers. The leader responsible for the IT strategic planning effort within an institution must plan for regular and ongoing review of the vision and purpose statements as well as the strategic principles. He or she must be ever alert to the need to "fine tune" the IT organizational structure, to provide new learning opportunities for IT professionals and others throughout the institution, and to continually seek opportunities to use new technologies in support of reengineered processes of the institution.

Continuous feedback to the Learning Action Plan may take different forms depending on the IT organization and the specific community college. In some institutions, specific "milestones" may need to be identified with a formal review process established. In other institutions, there may be a need to closely integrate the IT Learning Action Plan with the overall institutional strategic plan and coordinate reviews accordingly. In still other institutions, the feedback may come in the form of ongoing discussions with IT professionals and customer community representatives with modifications made to the Learning Action Plan on an "as needed basis" rather than at specific points in time.

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[23] Ibid., pp. 32-35.

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Strategies for Developing a Learning Action Plan

This section offers suggested strategies for developing a Learning Action Plan within the IT organization at a community college, along with examples from several of the institutions represented in the League/CAUSE Task Force discussions. It is important to note here that there is no one "right way" to complete the strategic planning process within an institution. Each institution's culture, customer communities, and technology readiness and aptitude are different.

Identifying Organizational Cultures and Determining Strategies Based on Culture Types

The first step in the new strategic planning model is for IT leaders to learn as much as they can about the organizational cultures within which they will be required to work. That means identifying the culture of the IT organization as well as the culture of the other units within the institution.

Suggested Activities and Examples

✔ *Identify the organizational culture of the IT organization.*

Invite several members of the IT organization, representing the various subgroups within the department, to participate in an exercise designed to identify the culture of the IT organization. Ask each individual to complete the "Survey on Organizational Culture" worksheet in Appendix A of this paper. When all worksheets have been completed, ask each individual to share the results of his or her worksheet with others and discuss the results until the group can come to consensus. Discuss how the group's answers to the questions in the survey affect the way in which strategic planning can or should occur within your IT organization. Determine whether or not changes need to be made to the IT organizational culture based upon your analysis of the current culture and the need to incorporate a new approach to strategic planning.

✔ *Identify the organizational culture of other work units within the institution and/or the institution as a whole.*

Some ways that this might be accomplished include the following:

- Answer the questions on the "Survey on Organizational Culture" based upon your personal perception of the organizational culture of the specific work group or the institution as a whole.
- Invite a small group of individuals representing various segments of the IT department to complete the survey based upon their personal observations of the specific work group or the institution as a whole.
- Invite representatives from the specific work group to join representatives from the IT department in analyzing the organizational culture of the work group using the survey. If this approach is used, it is important to make it clearly understood that the purpose of the exercise is to learn as much as possible about how the work group functions so that the IT organization can be effective in working with this group.

Once the group as a whole or the IT leader has identified the characteristics of the work group or institution's organizational culture, he or she can develop strategies designed to work within that organizational culture.

Example: Maricopa Community Colleges

An analysis by a combined team of individuals from several of the Maricopa Community Colleges and individuals from the centralized IT organization at Maricopa concluded that the predominant culture within the Maricopa system was a

consensus culture. The Maricopa district is composed of ten autonomous colleges and a district office. Each college has its own mission statement as does each major division within the district office. Because each college is autonomous and can make major decisions without consulting other institutions or divisions within the district, the need for consensus management is strong, particularly in the areas of establishing long-range technical plans and any type of technology policies or standards.

With this situation in mind, the IT organization launched a major strategic planning effort in the fall of 1992 modeled after the Learning Action Plan approach presented in this paper. The vice chancellor of information technologies and the director of computing and communications spent the 1992-93 academic year meeting with each established technology user group and every district-wide interest group concerned with information technology usage (i.e., directors of admissions and records, financial aid directors, etc.), and spent a minimum of one day at each college talking with faculty, students, staff, and administrators. In all, over 500 individuals were interviewed in the development of the Maricopa IT Learning Action Plan. This process was time-consuming and did not, in reality, result in a plan that was dramatically different from one that might have been developed without such wide-based input and discussion. Within the Maricopa culture, however, this type of consensus building and user-interaction is imperative to secure district-wide buy-in for major changes such as business process reengineering, one of the major components of Maricopa's Learning Action Plan.

✔ *Modify or change cultures.*

When changes or modifications to organizational cultures are deemed appropriate, consider the strategies or guidelines originally developed by Paul O'Neill:

- Explain to all organization members the absolute necessity of the culture change, discussing the environmental changes that have created the need for change and the likely, but undesirable, consequences of organizational inaction.
- Describe the corporate vision and how the organization must successfully operate in the near future.
- Clearly define the operational goals of the change effort.
- Clearly define management's new roles under the new culture.
- Provide a common experience that demonstrates to all the feasibility of the proposed changes.
- Have the senior managers spend substantial time proactively modeling the expected behaviors involved in the change.
- Provide opportunities for the management group, in general, to practice the new behaviors.
- Follow up the successful change effort with meaningful recognition of all participants.[24]

Example: Maricopa Community Colleges

The centralized information technology organization within the Maricopa Community College District consists of several components including applications programming, systems programming, network operations, computer operations, library technical services, video communications, telecommunications, and computer repair services. Traditionally, each of these units worked within a specifically focused arena with little interaction between or among units, resulting in redundancy of effort in many cases and, at times, development of inappropriate solutions to business problems within the institution.

In the summer of 1992, the leadership of the IT organization decided that a new approach was needed to better utilize the talents within the IT organization and to minimize duplication of effort. The concept was to change the "single work unit" culture to a more interdisciplinary culture. To effect this change, the entire IT organization was called together in a departmental staff meeting and was told that a new reward system was being implemented for the IT organization, to be based on cross-functional team "victories." A "victory" would be declared whenever a cross-functional team, composed of individuals from two or more units within the IT department and one or more representatives from either a business unit or a college, identified a business problem that needed to be addressed and successfully implemented a solution based upon the work of the entire team.

The IT organization was challenged to meet a goal of ten cross-functional team victories during the 1992-93 fiscal year. As victories were achieved, celebrations were held at the users' office location. A large plaque with a picture of the team and a description of the problem/solution was prepared and hung on the "ITS Victory Wall" at the district office. Each individual team member received a smaller plaque containing a picture of penguins (the IT department mascot) celebrating and noting the victory date.

This approach to changing the culture of the IT organization to one of teams rather than individuals was extremely successful and is being expanded for the 1993-94 fiscal year.

Identifying Customer Communities

To identify the customer communities—the second element of context for the Learning Action Plan process—it is important to recognize that the "customer" is the function or person who relies on the output of a process to either satisfy a need or accomplish a task. Customers can be internal (i.e., functions or individuals within the institution) or external (i.e.,

[24] Paul O'Neill, "Transforming Managers for Organizational Change," *Training & Development Journal*, July 1990, pp. 87-90.

students, competitors, employers, vendors, and so forth). Once the various customer groups have been identified, you must determine and understand their needs, prioritize these needs so that the maximum impact is obtained, and then develop measurement tools to make certain that the customer's needs are satisfied.

Suggested Activities and Examples

✔ *Use customer focus groups and survey instruments to develop a clear picture of customer expectations and needs.*

Ask each subgroup within the IT organization to individually develop a list of their internal and external customers and suppliers, then convene a meeting to compare and contrast the lists of all subgroups to ensure that all customer/supplier relationships are addressed. If the identified customer of a particular unit is not the final "end customer," ask the group to identify all of the intermediate customers between the IT unit and the end customer. Once the various customer groups have been identified, ask the individual subgroups to share their opinions about what their customers need or expect from them. Conduct a focus group discussion session with each customer group to determine their needs and expectations.

Where appropriate, develop a survey instrument that can be more widely distributed to obtain quantitative data on customer needs and expectations. When written surveys are used, it is helpful to have IT staff do follow-up phone interviews, with key users or on a random basis, to obtain additional information from individuals who might not have completed the written survey. Use both the qualitative data obtained in the customer focus group discussions and the quantitative data obtained through the survey instrument to determine the most critical customer needs.

Develop process measures that relate directly to critical customer needs. These measures should be specific, continuously measurable, and accurate. Continue to collect data on process measures over an extended period of time to ensure ongoing performance.

Example: The Washington Community and Technical Colleges

The Communications and Technology Center (CTC) of the Washington Community and Technical Colleges has a strong governance structure with articles of incorporation and bylaws, a board of directors, and several key executive and advisory committees. The technical advisory committees of college experts advise the CTC staff on strategic and tactical plans, hardware and software requirements, and networking requirements, and participate in selection of hardware, software, and networking solutions. Below the technical advisory committees lie the user groups representing each major function of the colleges (e.g., registrars, financial aid officers). These user groups meet four to six times a year and go through a formal decision-making process to identify maintenance requests and/or recommendations for application software enhancements.

The CTC has developed a list of "critical success factors" against which information is gathered to determine the efficiency and effectiveness of CTC activities. (A copy of these factors is included in Appendix D of this paper.) Measurement of how well the CTC meets these critical success factors is accomplished in several ways:

- Customer satisfaction information is collected via surveys sent to all employees at all colleges.
- Financial performance of the CTC is analyzed each year by combining the cost of CTC operations and costs at the colleges for administrative computing. These costs are then compared with CAUSE financial database information for the largest multi-campus districts in the nation.
- The level of success in accomplishing system maintenance and enhancement project schedules on time and within budget is formally evaluated and reported in the minutes of the CTC committee meetings.
- There is formal documentation of college staff testimony, positive or negative, as member(s) of any CTC or non-CTC committee.
- The number of system defects and the hours to "fix" them are tracked through "incident reports" and reported to the major advisory committees at year-end with a comparison to the prior year's performance.

✔ *Ask each IT professional to spend a period of time working in the customer environment to learn what the customer does and to see how the technology tools are actually being used in the customer's environment.*

Example: Maricopa Community Colleges

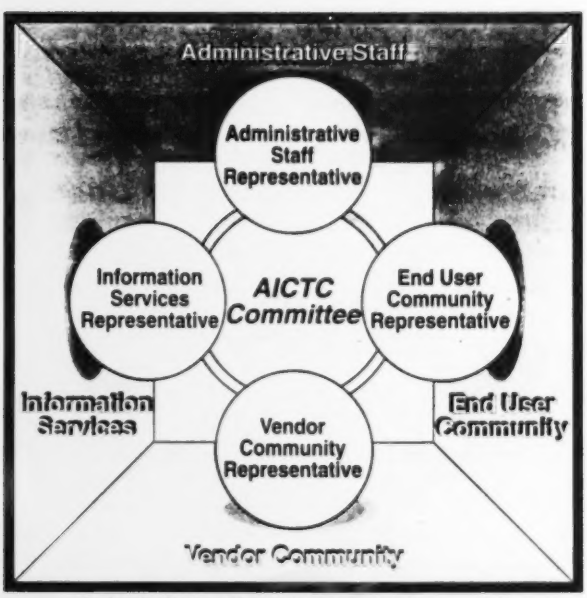
The IT organization at Maricopa Community Colleges has launched two separate programs to obtain better feedback on customer expectations and needs. First, each IT professional within the organization is required to spend a minimum of one full week working within a customer environment during the academic year. This does not mean that the IT professional simply relocates to another office at a college for a week, doing his or her regular job. It means that the IT professional identifies a customer group which uses his or her services and then works in that customer's office, doing the same work that the customer does for one week. This program has proved to be highly successful in two ways: (1) it builds better relationships and communication between the customer group and the IT professional; and (2) by working in the customer's area, doing the same work as the customer, the IT professional gains new insight into how the technology tools can be improved.

Second, the centralized IT organization at Maricopa has instituted a program of "externships," where IT professionals from the central organization are rotated out to a college location for a period of six months to one year to work in a college technical environment. Often, a college-based technical person is rotated into the central office for a similar period of time—a type of information technology "exchange program." This exchange program, which has been very successful, gives individuals an opportunity to be exposed to a different working environment; gives them an opportunity to learn or use new skills; and exposes the rest of the organization to new ideas and different outlooks.

✔ *Develop institution-wide advisory committees with a broad representation from all elements within the institution to act in an advisory capacity to the IT organization.*

Example: Monroe Community College

At Monroe Community College, the Administrative, Information and Communication Technology Committee functions to develop and coordinate the college's technology strategic plan, to review and prioritize projects, to approve equipment acquisitions, and to develop technical standards for the institution. Included on this committee are representatives of the faculty, students, staff, and interested community people. The figure below depicts the make-up of the AICTC at Monroe.



Administrative, Information and Communication Technology Committee (AICTC)

✔ *Meet often with customers in small group settings to develop solid personal relationships.*

✔ *Involve customers in project teams or task forces, including teams to develop metrics and benchmarks for IT success.*

✔ *Use information technologies such as integrated voice response, computer conferencing, or bulletin board systems to collect and analyze customer feedback.*

Example: Maricopa Community Colleges

While the Maricopa Community Colleges have traditionally used function-oriented or system-oriented user groups to obtain feedback on the IT systems and technologies supported by the IT organization, a new technology is currently being used to collect feedback from less traditional sources—the students. The colleges have begun using a voice processing tool called "audio forms" to collect feedback from the students on the Maricopa touch-tone registration system. The audio-forms feature of the voice mail system at the district office enables students to call a specific telephone number and give oral feedback to a number of questions designed to determine how the current touch-tone registration process/technology is viewed and how it can be improved. Student responses are retrieved daily and submitted to the cross-functional team of admissions and records staff and IT departmental staff responsible for the system. Additional features/functionality and revised functionality changes are made on the basis of student input.

✔ *Appoint "customer advocates" from the IT department.*

The customer advocates' responsibilities would include remaining in constant touch with the customer group, thus building a close and trusting relationship; understanding the customer's business; ensuring that all IT services and problems are handled to the satisfaction of the customer; explaining technological opportunities to the customer; and participating in joint customer/IT planning activities.

✔ *Recruit users to join the IT department to develop a more customer-driven focus.*

✔ *Hold technology awareness briefings to educate users about the current and future uses of technology.*

✔ *Co-locate IT people in user departments.*

✔ *Ask the help desk or operations group to compile a weekly or bi-weekly report that highlights the trouble areas they are seeing and circulate these reports throughout the department.*

✔ *Take IT staff whose jobs typically keep them within the IT department on "field trips" with IT field staff.*

✔ *Require IT staff to make three to five outgoing calls per week to users they have dealt with during the past week to make certain that the users have received the help they needed and that there is no further work to be done.*

✔ *Develop a "service representatives" service that assigns IT staff to departments to help the departments with IT planning and problem resolution.*

✔ *Establish user liaisons in each department who will be responsible for their department's information technology systems and who will act as the primary contact for other users on campus who need information about the department's systems.*

Identifying the Current Technology Level of the Organization

To know how much we should be investing in new technologies or IT infrastructure, we must first determine the current technology base or level of the institution.

Suggested Activities and Examples

✔ *Use the* CAUSE/EDUCOM Evaluation Guidelines for Institutional Technology Resources.

The guidelines for evaluating institutional technology resources endorsed by CAUSE and EDUCOM were created to help institutions do a self-evaluation to determine the adequacy of their institutional information technology resources. These guidelines are included in Appendix B.

✔ *Conduct a technology audit of your institution using a variety of techniques to determine your current technology base.*

Suggested techniques include using

- Personal interviews with department heads, key users, and others
- Written survey instruments sent to all faculty and staff
- Electronic surveys conducted via electronic mail systems
- Physical inventories of voice, data, and video equipment for comparison to the formal property control documentation
- System reports available from most host computers and digital telephone systems containing usage and performance information
- Physical documentation of the cable plant infrastructure used for voice, data, and video communications

Example: Monroe Community College

In 1992, Monroe Community College hired a consulting service to assist the college in developing a master design for a college-wide voice, data, and video cabling system or "backbone." Information was collected from a wide variety of sources during the study, including comprehensive personal interviews with 116 department heads and key users, a user survey distributed to all faculty and staff, a complete inventory of the existing cable plant, detailed input from academic and administrative computing personnel, and extensive research of current market trends using trade references and manufacturers' data. Part of the study included an "automation survey" sent to all faculty and staff. The purpose of this portion of the survey was to gain information about general usage patterns of the various existing systems.

The comprehensive technology audit process at Monroe resulted in several key recommendations for voice, data, and video services at the college, including the development of cabling standards for voice, data, and video applications.

Identifying Key Organizational Goals for Alignment

To make certain that the IT function is appropriately aligned with the overall goals of the institution, those overall goals must be identified.

Suggested Activities and Examples

✔ *Collect documents that reflect the directions that the institution, as a whole, wishes to take.*

Likely sources for this information include

- College mission and/or vision statements
- College catalogs
- Brochures on college programs and curriculum
- Text of major speeches made by top leadership of the institution, trustees, or key faculty members
- Strategic plans for the institution as a whole or for major divisions/units of the institution
- Press releases or other public relations documents about the institution
- Mission or vision statements of other work units within the institution

✔ *Convene a small group representing each of the major areas within the IT function to review and analyze the collected documents, identifying the key directional statements or goals.*

Have the group brainstorm all of the ways in which the application of information technology can contribute to the

successful completion of each goal identified in this analysis process. After identifying how the application of information technology can be used to help the organization successfully reach its institution-wide goals, use this information as a guideline for priority setting within the IT functional area.

Many of the documents, including college mission statements, may have no specific reference to information technology of any kind. This does not mean that there is no way to align the IT function with the overall direction of the institution. The group should identify ways in which the application of information technology can be used to further the overall goals of the institution, regardless of whether or not the institution has made a formalized, written commitment to technology applications.

Example: Maricopa Community Colleges

At the November 1992 retreat of Maricopa's governing board, Chancellor Paul Elsner presented "A Master Strategy for the Remaining Decade," which proposed twenty-six steps necessary to secure Maricopa's future. While all of these steps will be impacted by or supported by the use of information technologies, several steps directly relate to Information Technologies Services:

- Establish a second generation of network support for the colleges' technology expansion.
- Cross over to more open entry/exit, distance learning, video conferencing, network course support.
- Implement a variety of programs around Quality Improvement. These include: (a) reengineering and redesigning work, (b) increases in productivity, (c) examining time on task, and (d) elimination of paper processes.
- Institute programs to shave overhead over the next five years.

The final step is for all of Maricopa to set upon "reorganizing, renewing, and transforming themselves for the millennium."

Example: Dallas County Community College District

In Texas, strategic planning starts with the state legislature which develops a vision statement (mission and philosophy) and functional goals. Each agency or institution, then, develops its own statements of mission, philosophy, external/internal assessment, goals, objectives, and strategies to conform to, or address, the statewide plan.

At the Dallas County Community College District, the institutional plan is developed by the chancellor's cabinet which includes the chancellor, the vice chancellors, and the college presidents. Each college and district office work unit then develops "action plans" which align with the institutional plan. All elements of the institution-wide plan and the individual unit plans are customer focused. This approach has all state agencies working from the same template. In addition, the output measures identified with the strategies in each of the institutional plans are important because a portion of state funding is based upon institutional performance as it relates to success in meeting the agreed-upon output measures. The net result is a coordinated statewide plan and performance-based funding identified with how well the Texas institutions are meeting customer needs.

Example: Sinclair Community College

Sinclair Community College has published several documents which provide information on how Sinclair's IT department needs to direct its efforts in order to align with the institution's mission and goals. Selected excerpts follow.

From Sinclair's *Major Institutional Objectives for FY 1993-94:*

- Continue implementation of new computer information systems applications: telephone registration, human resources, facilities scheduling and management, continuing education, barcoding; continue to improve user support services, training, documentation, and help desk services; improve the process for identification, approval, and implementation of users' strategic initiatives; implement approved changes to the Information Systems and Services organizational structure.
- Develop a campus-wide telecommunications strategy for voice, data, and video.
- Develop an overall educational technology vision and strategy for the college; complete development of a comprehensive operational support plan for academic computing services, ITFS, multimedia, and distance education.
- Implement new instructional delivery strategies including ITFS and interactive video to complement ILC, TV Sinclair, and College Without Walls to enhance retention, improve quality, and eventually reduce instructional costs.
- Develop a comprehensive educational technology plan that includes training and support for faculty in the adaptation of new technologies and instructional delivery systems; initiate a process to study computer laboratory needs and accompanying usage; develop an academic computer plan which would further enhance the operations of the facilities and services.

From *Initiatives for Action: FY 1993-94 Strategic Opportunities*

- Promote enhanced flexibility and productivity in the delivery of instructional offerings and services through the development of a comprehensive educational technology strategy, including ongoing training of and support for employees in the adaptation of new technologies and instructional delivery systems.
- Implement the next phases of the college's new com-

puter information and decision-support systems (telephone registration, continuing education, human resources); implement specific strategies to achieve greater levels of efficiency and effectiveness in institutional management.
- Complete development and begin implementation of a comprehensive plan for academic computing services and support.

From *Into the Next Millennium: Possible Consequences of Trends and Issues Likely to Influence Sinclair's Future by 2005*:

- Knowledge will be the new capital (primary resource) of 21st century society, and securing access to knowledge will be viewed as the key to how individuals as well as economic, social, and political units achieve their goals of economic and social advancement as well as personal enrichment.
- The campus and its satellite locations will have interactive telecommunications links with each other and with worldwide locations from which learning opportunities will be transmitted.
- Instructional delivery, no longer constrained by traditional classroom locations and times, will increasingly focus on tailoring "portable" learning opportunities customized for individual needs that give students maximum flexibility in achieving their goals.
- As Sinclair's orientation toward access shifts toward providing access to knowledge, it will face significant competition from a host of other knowledge providers that will attempt to provide access to wider and/or specialized bodies of knowledge through more efficient, faster, and more convenient modes of delivery. Sinclair will be challenged to find an appropriate niche in this new, highly competitive knowledge marketplace.
- Finite limits with respect to the extent which student support services can be delivered at varying times and locations will force a greater reliance on interactive electronic approaches to meeting students' needs through methods that transcend the traditional constraints of location and time.
- Digitized electronic technologies that permit interactive learning and include high definition image transmission will be the major infrastructure consideration for the college during the planning horizon. Retrofitting existing facilities to accommodate the changing nature of instructional spaces will dominate facilities planning.
- Employee workstations will have to accommodate new multi-faceted, interactive electronic technologies as well as reflect greater accommodation to advancements in human factors engineering and ergonomics.

Developing and Communicating a Shared Vision

To truly develop a shared vision for the information technology organization, there must be broad-based involvement in the process by everyone within the organization. No one person or group of persons may be allowed to overshadow another. Everyone must be given an opportunity to participate.

Suggested Activities and Examples

✔ *Gather individuals from the IT organization into discussion teams to develop the basis for a statement on shared values and a statement of purpose for your organization.*

Ideally the discussion teams will be small—ten to fifteen people—and cross-functional in makeup. A Total Quality Management technique called "affinity diagramming" is useful for grouping complex, apparently unrelated ideas into natural and meaningful groups of data. To use the affinity diagram technique, follow these guidelines:

1. Clearly identify the goal of the affinity diagram process, i.e., what it is you are trying to accomplish by using this tool. In this instance, the goal is to develop a list of shared values for the IT organization and a list of purposes for which the IT organization exists.
2. Ask individuals to review sample documents to get a sense of the type of items that may be included in a statement of shared values and a statement of purpose. (The samples found in Appendix C of this paper should be useful for this purpose.) Once the samples have been reviewed, they should be discarded so that the group does not refer back to them for confirmation or discussion.
3. Ask individuals to write their ideas on separate 3"x5" Post-it Notes, using felt tip markers or pens with large enough points so that the information is readable from around the room.
4. Participants then take their notes to the front of the room and "post" them on a white board or wall, reading the phrase they have written on the note aloud. At this point, the notes should not be placed in any order, but be put randomly on the board.
5. The process of generating and posting ideas should continue until participants have exhausted all ideas.
6. When all ideas have been generated, the participants should be asked to silently move the notes into natural groupings. Notes can be grouped and regrouped by anyone at any time.
7. If an item appears to fit in more than one group, one of the participants may create a duplicate and repost the duplicate into the second category.
8. Once the groupings are determined, discussion is allowed. Minor additional rearranging may occur at this

time as the participants clarify their understanding of what has been accomplished.

9. Once the groupings are clear, headers for each grouping are identified and placed at the top of the grouping.

When each of the small discussion groups has completed the affinity diagram process, a cross-functional team of IT staff members should be asked to take the groupings of ideas and arrange them into logical text form.

✔ *Share the draft documents with customer groups.*

The draft documents should be shared with all members of the IT organization with opportunity for further comments and suggestions. After an appropriate period of time, the final documents should be "wordsmithed" and put into proper format for printing. Final copies of the Statement of Values and the Statement of Purpose should be given to each member of the IT organization and should be shared with major customer groups throughout the institution. Some organizations go so far as to have summaries of these statements printed on the back of business cards which can then be handed out by the IT staff as they work with customer groups.

See Appendix C for examples of vision/values/purpose/mission statements from Maricopa Community Colleges, Miami-Dade Community College, Washington Community and Technical Colleges, College of DuPage, and Chemeketa Community College.

Developing Strategic Principles

Strategic principles are clearly written statements of direction which should be developed by IT management, in cooperation/collaboration with IT staff and customers.

Suggested Activities and Examples

✔ *Convene members of the executive team of the IT organization to identify an initial set of principles for the IT organization.*

This leadership group should review Tapscott and Caston's characteristics of well-designed principles outlined on page 7 of this paper and the list of environmental factors from which principles should be written (pages 8-9).

✔ *Convene all members of the IT organization in a retreat or workshop to give the rest of the IT organization a chance to review and further develop the draft principles.*

Depending on the size of the organization and number of individuals involved, a half-day or full-day retreat or workshop should be sufficient to give individuals a chance to respond to the principles identified by the executive team and for the entire group to identify the restraining forces, driving forces, and implications for each of the initially identified strategic principles. The following techniques are suggested for this workshop/retreat.

Prior to the retreat/workshop:

- Circulate the complete list of strategic principles for the IT organization, along with the statements of shared vision or purpose, to each member of the IT organization. Accompanying these documents should be an explanation of what is to happen in the workshop/retreat.

- Divide the participants into small groups of eight to ten people each. Care should be given to separating people with like functions into different groups so that there is a cross section of the IT organization in each small group to the degree possible.

- Identify individual group facilitators and recorders for each small group. These individuals should meet in advance to review the agenda for the workshop/retreat and to receive any additional training required for the special techniques to be used in the small groups.

- Assign three to four strategic principles to each group, taking care to ensure that no group gets all of the strategic principles from any single category. It is also important to make certain that any strategic principles that relate to the IT organization itself should be reviewed by more than one small group during the workshop/retreat.

At the workshop/retreat:

- The head of the IT organization should review for the full group how the strategic principles were drafted and how they relate to the organizational statements of shared vision and/or purpose. He or she should also review the goals of the workshop/retreat with participants, describing the techniques that will be used in each small group to elicit responses and discussion from the individual group members.

- Each small group should be seated at a round table. Tools to be used by the facilitator and recorder are a flip chart, various colored markers, and tape or push pins depending upon the wall covering of the room.

- When the small groups are convened, the facilitator should begin with the first principle assigned to the group, asking each individual to contribute what he or she sees as any restraining forces, driving forces, or implications that may come from the establishment of that strategic principle for the IT organization. Key to this brainstorming discussion are these TQM principles:
  1. There is "no rank" in the group. Everyone is encouraged to participate regardless of their position in the organization.

2. All ideas are good; evaluating, critiquing, criticizing of ideas is not allowed.
3. Participants are allowed to "piggy-back" off each other's ideas.
4. All ideas presented are recorded.

As the ideas are generated and the flip chart pages are filled, they should be posted onto the walls of the room in the area of the small group so they can be referred to during the remainder of the discussion.

- When the restraining forces, driving forces, and implications are identified for each of the strategic principles assigned to the small group, the facilitator should use the following technique (called N/3 Method of Prioritization) to rank the ideas. The steps to this technique are as follows:
  1. Review the items on the flip chart within each of the categories (i.e., restraining forces, driving forces, and implications) to make certain that everyone understands the ideas under discussion.
  2. Count the number of items listed in each category and divide the total number by three. This will be the number of votes each participant will cast. Instruct each participant to vote for the appropriate number of items.
  3. Tally results and record on the flip chart.
  4. Discuss the results to ensure that consensus is obtained.

- At the end of the workshop/retreat, the small groups should reconvene into the full group for a wrap-up discussion of what will happen next to complete the drafting process of the organization's strategic principles.

After the workshop/retreat, a small group that is representative of the entire department should work with the executive group to refine and condense the contributions that came from the workshop/retreat. A final copy of the strategic principles, along with the restraining forces, driving forces, and implications should be shared with every member of the department. These form the foundation for the tactical or operational plans for each individual work group within the IT organization.

Example: Maricopa Community Colleges

The process described above was used by the Information Technologies Services department of the Maricopa Community Colleges to complete and refine the list of IT strategic principles for the department. A complete list of the principles can be found in Appendix D of this paper. A sample of what a principle looks like once the restraining forces, driving forces, and implications have been developed by the group as a whole is also included.

Dealing with Organizational Structure Issues

Suggested Activities and Examples

✔ *Conduct an "audit" of the IT organization's readiness for adopting a new approach to strategic planning.*[25]

Executive staff of the IT organization should meet with the top managers of each IT work group to assess the current IT organization and overall institution in light of the following:

Technology Factors

- What is the current level of technology usage at the institution? How does this match with the current level of technological skills within the IT organization?
- What type of hardware is on the desktops of faculty and staff within the institution? What type of hardware can be found in academic labs?
- What is the extent of voice, data, and video networking within the institution?
- What is the current level of IT literacy at the institution?
- To what degree are voice, data, and video integrated technically within the institution? organizationally?
- What need is there for formally adopted standards regarding interoperability of hardware and software within the institution?
- How many platforms and/or protocols are supported within the institution?
- Which work groups within the IT department or elsewhere in the institution are currently responsible for each of the information technologies identified?

Resource Availability

- How many people are currently employed in the IT organization? What is the expertise level of these people?
- How many people are employed within the institution, but outside of the IT organization, in direct support of IT for either academic or administrative purposes? What is the expertise level of these individuals?
- What is the current IT department operational budget? capital budget?
- What is the current institutional budget designated for the purchase or support of information technology that may be outside of the IT department budget?

Political Factors

- What is the opinion of faculty, overall, regarding information technology and its use within the institution?
- What is the overall satisfaction level of faculty regarding the use of information technology within the institution?
- What is the status of the IT organization within the institution? Does the perception of the IT department about its status accurately reflect reality?

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[25] Ernst, op. cit.

- How may a reorganization of the IT department be viewed by the rest of the institution?
- How does the IT organization get feedback from the rest of the institution and what does it do with this feedback?
- Who are the "power brokers" at the institution? Who has "direct power" by benefit of the organizational chart? Who has "indirect" power by benefit of relationships, longevity, or expertise?
- What do the IT customers expect from the IT organization and how are these expectations set?

Management and Leadership Factors

- Does top management of the institution appreciate and support the importance of information technology within the institution?
- How strong is the management of the IT organization?
- How is the management of the IT organization viewed within the overall institution?

IT Departmental Factors

- Are there any conflicts of interest within the IT organization?
- Are there any missing functions or skills?
- Is there duplication of effort within the organization? Between the IT organization and other elements of the institution?
- Does each work group have a clearly identified and unique "charter"?
- Which work groups within the IT organization are dependent upon each other? Who are they? What internal walls or barriers exist between work groups within the IT organization? between the IT organization and others within the institution?
- What are the current complaints from the user community about services or products from the IT organization? How do these concerns get expressed to the IT organization? How are they handled?
- Is there any area of the IT department where multiple types of "expertise" are required? What are they?
- What are the strategic principles for the IT department and which work groups or units within the department are responsible for each?
- What tasks can best be accomplished centrally and which can best be handled in a decentralized mode?
- Are there any internal processes/procedures within the IT organization that need to be reengineered?

The group should use the answers to these questions to identify what changes need to be made within the IT departmental structure or within the overall institution in order for the institution to successfully implement and support the use of information technologies. The group should then analyze the IT organization's tolerance for change and make whatever initial structural changes can immediately be made based upon this analysis, addressing the most pressing problems within the department's tolerance for change. Next, the top management of the IT department should work with the human resources department of the institution to draft any new job descriptions that may be required and to process any reassignments or changes in reporting structures.

If total reorganization of the IT department is inadvisable because of either existing political situations within the institution or because the desired change would be too great for the organization to handle, the IT management may wish to consider other, intermediate ways to reorganize how work is assigned and completed within the IT organization including the use of self-managed or cross-functional teams.

Example: Maricopa Community Colleges

Three new "organizational concepts" have been implemented within the Maricopa Community Colleges Information Technology Services (ITS) department to address the immediate concerns of organizational structure while a total department-wide reorganization is analyzed.

First, a strategic consulting team has been formed with four individuals. Two of these individuals are called "IT strategic consultants" and their major responsibility is to work with various user groups to analyze business problems and to identify which individuals within the IT organization can best help solve these problems. A third member of the consulting team is a skilled applications programmer with expertise in computer operations and telecommunications/networking. His role is to provide initial technical support to the strategic consultants and to assist in identifying and documenting the technical expertise that exists throughout the district that may be tapped to help solve technology problems district-wide. The fourth member of the team is an individual trained in Total Quality Management techniques and meeting facilitation. He works as staff to the strategic consultants to facilitate group discussions and to help them in group problem-solving activities.

Second, there is an increased use of cross-functional teams to solve the business problems that arise within the IT department or within customer communities. These teams are convened and led by the strategic consultants from ITS and usually consist of the following "types" of individuals:

- One or more managers from the business unit involved
- IT strategic consultant
- Systems programmer
- Network professional
- Appropriate technologists (voice, data, video)
- Ad hoc reporting specialist
- End users or customers affected by business problems
- Representatives from any additional stakeholder constituencies

Third, the following "relational" organization chart is used in discussing the ways in which the various work groups or individuals within the ITS department relate to each other and to the customer communities.

This graphic clearly illustrates that the customer is the central focus of the ITS organization. The strategic consultant group has been described above. The R&D group are the individuals within the ITS department with major responsibility for innovation or for investigating new technology approaches. The technologists are individuals within the department whose primary responsibility is to work with one or more technologies or technical areas (i.e., networking, telecommunications, application programming, etc.).

Finally, the support services category contains all of the individuals within ITS who are responsible for providing consistent and efficient implementation, operation, and support of information technologies within the Maricopa Community Colleges (i.e., computer operations, network management, repair services, etc.) There are appropriate feedback loops for communication between the customer and the various elements of ITS, with particularly wide feedback loops between customers and our strategic consultants, the leaders of our cross-functional teams, and our support services group.

Example: Sinclair Community College

In the fall of 1993, Sinclair Community College began implementation of the Information Systems and Services reorganization project. This project was undertaken because the staff of Sinclair felt that the growth in IT functions had not been reflected in organization structure and because the position descriptions of IT staff did not reflect the real responsibilities of the positions. The new organizational structure is characterized by:

- Customer services attitude/TQM and continuous improvement
- Improved identification of responsibilities
- Improved responsiveness in all areas
- Team management and facilitator role
- Team approach to customer service
- Pushing down on the organization to achieve new opportunities
- Improved skill levels in a professional environment
  - consultancy and customer skills
  - business planning technical competency
  - technical breadth
  - planning and organization
  - partnering skills
  - effective change control
  - effective interpersonal and written communication skills
  - team participation
  - problem-solving skills

The new information technology organizational structure at Sinclair is based upon three elements of quality customer services and support:

Customer Support Services division has as its objectives:

- to improve understanding of user processes and objectives
- to provide direct support, training, and help to user departments on available applications/tools
- to work with divisions and departments to achieve effectiveness and efficiency objectives
- to promote efforts to integrate knowledge technology into business plans
- to assist in the development of new processes and identification/definition of new applications and tools
- to provide user departments with project management support for successful testing and implementation of new processes and procedures
- to increase staff skills in the areas of communication and customer service orientation

System Management division has as its objectives:

- to provide maximum availability, security, and performance of mainframe and network service
- to provide an environment for technical and customer analysis and review of emerging technology
- to develop and/or monitor third party development of user defined application software
- to increase staff skills in the areas of communication, customer service, and project management

Production Services division has as its objectives:

- to improve the quality, accessibility, and timeliness of production services to user departments
- to provide effective and responsive installation and maintenance services
- to maintain information on the status of production work for communicating with user departments to work with department staff in optimizing the utilization of local equipment and supplies
- to optimize the continuous availability of application services and tools to user department staff

Example: The Washington Community and Technical Colleges

The Washington Community and Technical Colleges' Communications Technology Center has developed two statements which relate to its IT organizational structure issues entitled (1) People Architecture, and (2) Organizational Architecture. These two statements are used to keep the CTC focused on the specific needs of people in the organization when evaluating and selecting any new technology, rather than focusing on just the technology. These "architectures" are included in Appendix C.

Example: Chemeketa Community College

Until two years ago, computing at Chemeketa Community College was organized in an "old-time, fiefdom" style with turf battles between academic and administrative computing eating up staff time, energy, and creativity, and actually impeding progress in IT development and use. This was also incongruent with Chemeketa's philosophy of "one class of educator," essentially the belief that all college employees are contributing to the educational mission of the college, regardless of their specific responsibilities.

An executive team made up of the president, chief financial officer, and academic vice president worked to reconfigure the computing organization by breaking down barriers that had historically built up, forming what is now called the Information Technology Group. More than thirty staff make up the new organization, which cuts across the lines of administration and instructional computing to support all uses of technology at Chemeketa. The Information Technology Group is managed by a team of five individuals. The concept of management by a team, rather than a line organization, is one that the IT Group is firmly committed to.

Chemeketa Information Technology Group

✔ *Increase the overall awareness of the IT department regarding new and emerging technical and management issues they will be facing in the years to come and foster the concept of the "learning organization" within the IT department.*

One way to accomplish this is to share a reading list with the IT staff, such as the selected bibliography provided at the conclusion of this paper. Discussion groups can be held on topics of particular interest to the group.

✔ *Remove barriers that may occur between individual work groups assigned responsibility for support of information technologies within the institution.*

One of the best ways to accomplish this is to develop a centralized help desk or help line to provide customers with a single point of contact for all information technology related issues.

Example: Monroe Community College

The Help Line at Monroe Community College provides the college community with a single source of contact for technical resources within the separate academic and administrative technology departments of the college. Users can receive technological support with respect to administrative computing, personal computing, network computing, and telecommunications needs by dialing one main telephone number. Though the current focus of the Help Line is support of computing and telecommunications needs, it is anticipated that the Help Line will expand to include other college departments that currently experience heavy end-user contact, including Instructional Services (video) and Printing/Publications.

The Help Line was established by a project team that consisted of Information Services staff and consultants. The entire Information Services department was involved in the actual development process by participating in a series of interviews conducted by the project team. Functional areas within the IS department were required to work closely together to conduct research, review and configure software, design physical layout, develop operating guidelines, review and assign staffing, and conduct in-house training.

The project team also involved several departments within the college in the development of a marketing campaign to launch the project to the college community. A combination of correspondence, electronic and voice messaging, and articles in various college newsletters was utilized to market the project and to ensure all members of the college community were aware of the service. Presentations made to all college departments convey the benefits of the service to users on a more personal basis.

The primary benefit of the Help Line is that it provides end users access to a wealth of technological support through

a single point of contact. Centralization of efforts through the Help Line, rather than through multiple contact points, also streamlines the functionality of the IS department by freeing valuable technical resource time to be directed toward system development and the development of strategic initiatives at Monroe Community College.

Example: Chemeketa Community College

The Information Technology Group at Chemeketa Community College established the Technical Assistance Center (TAC) to meet the IT needs of the entire college. In addition to serving as a traditional "help desk," the TAC also offers comprehensive consulting services and is a focal point for purchasing approval for all IT equipment. Anyone wishing to make a computer-related purchase works with a TAC consultant to determine the most appropriate solution. The hardware and software is approved and ordered through the center, and the order is then tracked through the center's management software, called the HEAT system. All TAC contacts are entered into this system. The tracking function has matured to the point where it is now possible to prescribe training programs based on analysis of requests and customer needs.

✔ *Develop inter-institutional cooperation and sharing mechanisms to remove or reduce barriers that may occur between the institution and similar organizations within a region and to achieve various types of economy of scale.*

Example: Mount Royal College

In Alberta, Canada, Mount Royal College and fourteen of its neighboring institutions have formed a consortium which obtains group pricing for a variety of products and also provides technical support services for certain products. The original motivation and justification for the consortium was for the institutions to participate in Digital Equipment Corporation's Campus-wide Software License Grant Program. The institutions pooled their allocated software maintenance funds and were able to pay for CSLG and the single consortium employee required to support the program, and still show significant savings for every institution. The consortium employee administers the process and provides technical assistance to the participating institutions. He has also helped to develop a DECNET-based Alberta Colleges e-mail network. Other developments under way include negotiation for joint purchase and maintenance of new administrative systems and obtaining preferred pricing for Novell, Borland, and Microsoft products. The consortium members also provide technical assistance for each other and sponsor professional development seminars.

✔ *Form an IT advisory council composed of an equal number of representatives from academic and administrative computing groups or other appropriate divisions and meet regularly to review all plans, approve actions, and share information.*

Example: College of DuPage

At the College of DuPage, the Administrative Systems Users Advisory Committee (ASUAC) is responsible for assigning the priority to all administrative programming requests. ASUAC is a group of representatives from each of the major units and the major computer users for the institution. Computing and Information Systems assigns programming/system work based on the priorities assigned by ASUAC prioritization and availability of staffing.

✔ *Map out positions the organization will eventually need so staff can target the jobs they want and develop the skills they will need to compete for them.*

✔ *Change performance measures and incentives and establish career development paths to match the new skills required in the organization.*

Identifying and Prioritizing Processes for Reengineering

Suggested Activities and Examples

✔ *Apply strategies and activities suggested by Hammer and Champy in* Reengineering the Corporation.

- Identify as many of the processes within the institution as possible, giving them names that express their beginning and end states (e.g., student recruitment to graduation or request for personnel services to payroll).
- Work with the customer communities associated with each end-to-end process, mapping how work flows through the institution within this process. This can be done using standard flow-charting techniques and several new software packages available on both the Macintosh and DOS platforms. It should be noted that this "map" is a process map, not a reproduction of the organizational chart.
- Use the following three criteria to determine which processes require reengineering:
  1. Dysfunction—Which processes are in trouble?
  2. Importance—Which processes have the greatest impact on the customer communities?
  3. Feasibility—Which of the processes lend themselves most easily to reengineering?

- Once the processes have been prioritized, convene a cross-functional team composed of representatives from the various institutional departments involved in the process, customer communities, and the IT department to further study the process including providing answers to the following questions:
  1. What does the process do?
  2. How does it perform?
  3. What critical issues govern its performance?
  4. What are the customer's underlying goals and problems?
  5. What steps in the process can be deleted or reorganized to streamline the process or to add value to the customer?
  6. How can information technology be used in the reengineered process to add value to the customer and to streamline the process itself?
  7. What benchmarks or measurements/criteria will be used to measure performance of the reengineered process?
  8. How will customer feedback be obtained and acted upon?[26]

Example: Dallas County Community College District

At the Dallas County Community College District, district information technology staff are working as participants in cross-functional teams to completely reengineer the student registration process. The impetus for this process overhaul came from a team at the Brookhaven campus. This team was composed of all campus users involved in the registration process plus the associate vice chancellor of information technology from the district office. The campus team developed a needs analysis using Total Quality Management techniques and benchmarking with other campuses throughout the United States which were considered to be of similar philosophy (i. e., a one-stop registration process geared to the needs of the student rather than the needs of the registration office).

A cross-functional team of campus and computer service personnel is currently finishing the detailed specifications necessary for programming, based upon the reengineered process developed by the campus-based project team. Other campuses within the Dallas district are now participating in the discussion, offering critiques and suggestions to the revised process.

The reengineered and reprogrammed registration process will be piloted at Brookhaven in 1994, with all campuses observing Brookhaven's experience. When the proposed new process and accompanying software system has received a sign-off from Brookhaven, all campuses within the Dallas district will begin using the new system.

This reengineering effort was unique for the Dallas district because of the level of involvement on the part of campus users and the cooperative team effort used to reach a successful conclusion. Continuous feedback will be sought from students and staff to fine tune the new system to better meet customer needs.

Developing Processes for Continuous Feedback to the Planning Process

A key premise that distinguishes the new Learning Action Plan model from the traditional strategic planning process is the concept of continuous feedback to the planning process, making the Learning Action Plan more "fluid" in nature than the traditional strategic planning "shelf" document.

Suggested Activities and Examples

✔ *Analyze feedback from the customer community.*

Where the IT department is already collecting feedback from customer communities, an analysis should be made to determine whether the feedback being received is actually reflective of the entire customer community or the result of "squeaky wheels" who take it upon themselves to provide input. For example, if the feedback on how the student information system is performing comes solely from the director of admissions and records and his or her staff, then input may not be complete. Other groups including students, program advisors, department chairs, financial aid staff, and deans of instruction may also use data from the student system and thus should be part of the customer community from which feedback on this system is solicited.

✔ *Use information technology tools such as computer conferencing to allow members of the various customer communities to give ongoing input and feedback to the IT planning process.*

Example: The Maricopa Community Colleges

The Maricopa Community Colleges have a locally developed computer conferencing system, Electronic Forum (EF), available at each of the ten colleges and at the district office. To obtain student and faculty feedback on the IT Learning Action Plan, the plan was posted to the Grand Forum on the EF servers at each of the colleges. These forums are available to all subscribers on the network. Students and faculty have been encouraged to review the ITS statements of values and purpose, strategic principles, and other elements of the Learning Action Plan on an ongoing basis. This input is monitored and collected by IT management, and appropriate revisions to the Learning Action Plan are posted back to the Grand Forum on an ongoing basis.

[26] Hammer and Champy, pp. 117-133.

✔ *Conduct open discussions with members of the customer communities about new developments in technology and their potential impact on the institution.*

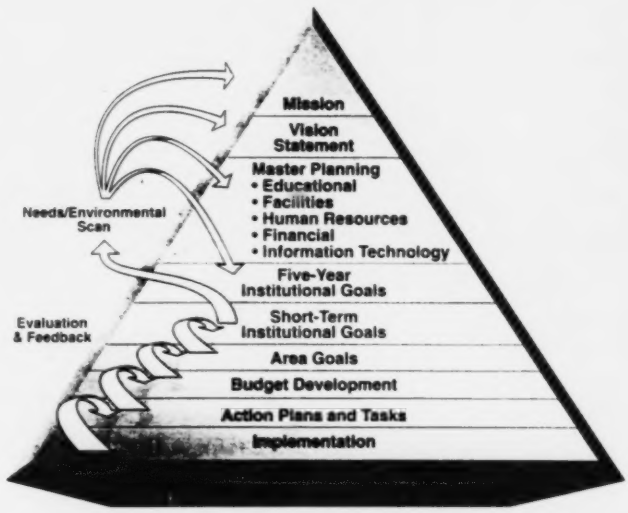
Example: College of DuPage

The College of DuPage has developed a series of "futures forums" to create an ongoing dialogue to build a broader strategic thinking process, as well as to view the future of the institution through the eyes of college leaders. The forums function like a Rand Corporation "think tank." They explore future institutional directions to support and enhance the college's vision. The forums meet quarterly and are made up of the Cabinet and three representatives from each of the following: Administrative Council, Faculty Senate, Classified Personnel Association Executive Board, and Student Government. Members of the Board of Trustees are encouraged to attend. Community members may be invited as appropriate. The sessions vary in substance, approach, and topic, but all have a structure with flexibility and a focus on the college's future vision rather than the past/present.

✔ *Formally structure the planning process to have evaluation and feedback mechanisms as part of the ongoing documented process at the institution.*

Example: College of DuPage

The graphic of the College of DuPage planning model below clearly depicts evaluation and feedback as integral parts of the ongoing process of planning at the institution.



College of DuPage Planning Model

4
Conclusion

As evident by the many strategies and examples included in this paper, there is no "one right way" to implement an IT strategic planning process within a community college. What is universal, however, is the need to take a fresh look at how we handle strategic planning for IT in our institutions, and using the Learning Action Plan model can help develop an energized approach to planning for information technologies in the 90s. The Learning Action Plan model focuses on issues related to our environments and the communities we serve, on the people within our institutions, and on the information technology for which we are responsible. It is important to note, in closing, that a very key element of the success of the Learning Action Plan model is the leadership shown by the IT manager in the strategic planning process.

As Bill Davidow, co-author of *Total Customer Service*, has been quoted as saying,

> There is a tremendous tendency to confuse the power of technology with the power of leadership. Leadership without technology can do a pretty good job, but technology without leadership is powerless.[27]

In the 90s, we cannot afford to focus solely on technology. We must, instead, focus on what our institutions need to do in order to succeed and survive and *then* determine how information technologies can best be used to serve those needs.

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[27] Glenn Rifkin, "The Great Enabler," *CIO*, August 1993, p. 94.

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Appendix A: Survey on Organizational Culture

Answer each of the following questions based on your observations of the group whose culture type you are trying to determine.

1. What is the structure of the organization? Is it vertically structured or horizontally structured?

2. Draw a copy of the formal organizational chart for the organization.

3. Who exerts "formal power" (power by virtue of position) within the organization? Circle the names of these individuals on the organizational chart drawn in response to #2 above.

4. Who exerts "informal power" (power by virtue of longevity, credibility, or personal relationships) within the organization? Circle the names of these individuals on the organizational chart drawn in response to #2 above. If these individuals are not on the organizational chart as official members of the department, add the names with dotted lines.

5. How are decisions made within the organization? Who recommends? Who approves? How?

6. What is the role of staff in the organization? What types of decisions are made at the staff level? To what degree does the leadership or top management of the organization value staff and input from staff?

7. How are employees within the organization evaluated? By whom? Against what criteria? Who establishes the criteria?

8. When conflict occurs within the organization, how is it resolved? Is the process formal or informal?

9. How does the organization view competition and being on the "competitive edge"? Is this a value of the organization? If so, how does the organization ensure that it remains on the competitive edge?

10. How does the organization receive or react to new ideas? What is the process of getting new ideas into the system? How and by whom are new ideas evaluated or reviewed?

11. What is the organization's view of risk-taking? Is risk-taking encouraged or discouraged? How is it encouraged? How is it discouraged?

12. How does the organization define and reward success?

13. How does the organization define and reward or punish failure?

14. How much does the organization value the "customer"? How is this value demonstrated? How is it communicated within the organization?

APPENDIX B:

EVALUATION GUIDELINES FOR INSTITUTIONAL INFORMATION TECHNOLOGY RESOURCES †

The purpose of this document is to provide institutions and regional accrediting associations with evaluation guidelines for information technology resources which they could use as a reference when developing their own standards for this area. These guidelines have been developed based on accreditation team experiences. They also have been reviewed and endorsed by the CAUSE and EDUCOM Boards, two key organizations in the information technology field in higher education (see back page).

INTRODUCTION

In the last decade, institutions of higher education have invested heavily in information technology resources. In particular, the availability of low cost, high powered desktop workstations has accelerated the move to distributed computing and high speed local and national networks. Organizational structures, often the most traditional parts of our universities, have been changing in response to the growing importance of information technology resources to the achievement of institutional missions.

Recently, calls from within and without the university to "take stock of how we are doing" have been heard. While self-assessment is not a new phenomenon in higher education, much national attention has been focused on it as a result of national reports on the "state of higher education."

One of the primary approaches to evaluation in higher education is the regional accreditation process. Accreditation is a voluntary, non-governmental effort by institutions. Its basic goals are to:

- Assure the educational community, the governing board, and the public that an institution has clearly defined educational objectives and has developed an environment that supports achieving those objectives according to agreed standards.
- Encourage educational improvement by self-study and periodic evaluation by qualified professionals.

The accreditation process is overseen through regional and specialized agencies (for instance,

† *Information Technology Resources—This includes academic computing, administrative computing, and telecommunications resources (voice, data, and video). Since accrediting guidelines have been established for libraries, these guidelines do not focus on that area.*

engineering and business administration) which develop accreditation guidelines and standards and administer the periodic team visits. For a general accreditation visit these can be separated by as much as ten years.

In most cases the accreditation team review is preceded by the development of an extensive self-study report by the institution that is organized around accreditation guidelines and standards. Such guidelines and standards are published by each accrediting agency. Only recently have information technology issues reached the attention of the accrediting agencies through the process of review and development of the guidelines and standards.

In order to assist with one small part of the evaluation process, both self-initiated and by accrediting agencies, we offer these guidelines for information technology resources. We avoid a prescriptive approach but rather offer a set of questions that will help institutional planners clarify their approach to providing these important resources. In addition, these guidelines will help institutional management with self-assessments that are part of the periodic accreditation process.

These guidelines were developed and approved by the Boards of CAUSE and EDUCOM, the two major national organizations dealing with information technology issues in higher education.

GENERAL REQUIREMENTS

Information technology resources, including software, data bases, computers, networks, staff, and other resources, support institutional academic programs and institutional management/operations at appropriate levels.

1. *Institutional Planning*. The institution, in its planning, recognizes the need for management and technical linkages among information resource bases (libraries, academic computing resources, administrative computing resources, telecommunications networking, and other learning resource centers).

2. *Access*. Information technology resources, in conjunction with other learning resources, are conveniently accessible to all students, faculty, and staff.

3. *Staffing*. Professional staffs with appropriate expertise are available to assist the faculty, students, and staff in making effective uses of all information technology resources.

4. *Academic Program Support*. The academic programs are supported by the appropriate information technology resources such as software, documentation, data bases, hardware, networks, etc.

5. *Management Support*. The institution's senior administration recognizes the need and supports the effective uses of information technology resources. The institution's operations and management are supported by the appropriate information technology resources including applications software, data bases, documentation, hardware, networks, etc.

6. *Resources*. The institution's resources (staff, budget, equipment, facilities, etc.) adequately support the information technology resources and services function.

7. *Information Technology Planning*. A well developed planning process involving faculty, senior administrators, staff, and students is in place for the institution's information technology resources and services.

8. *Committees*. Appropriate structures, such as user and policy committees, exist to provide guidance for the planning of the institution's information technology resources and services.

GUIDELINES

The following sections provide questions to help the evaluators focus more directly on various aspects of the general requirements for information technology resources. Rather than being prescriptive, these questions highlight areas that should be explored to better understand the requirements for integrating information technology resources into the institutional mission.

Guideline #1: Quality of Applications Software and Hardware

Computing software and hardware resources are appropriate in quality, depth, and currentness to support the institution's mission through its academic program offerings and its institutional operations and management.

1.1 Are software and hardware resources appropriate in quantity and quality to meet the needs of the curriculum and research on and off campus and the needs for institutional management and operations?

1.2 Are the applications software and hardware resources regularly updated to meet the current academic and administrative program needs?

1.3 Are the acquisitions and gifts of software and hardware consistent with the academic and administrative program needs?

1.4 Are the written policies and procedures for the acquisition of software and hardware kept current and are they widely circulated among academic and administrative departments?

1.5 Do policies and procedures exist that encourage the legal and ethical uses of software by students, faculty, and administrative personnel?

1.6 If an institution relies on the computing resources of other institutions, does it have a well-conceptualized rationale specifying the roles of both on- and off-campus computing resources?

Guideline #2: Support Services

The planning and acquisition of new information technology resources are timely, and the ongoing support services (documentation, development, consultation, training, maintenance, etc.) meet the needs of the institutional users.

2.1 Are faculty and administrators provided an opportunity to contribute in the planning, selection, and evaluation of the information technology resources needed by the academic and administrative programs?

2.2 Are adequate support services (training, consultation, documentation, development, maintenance, etc.) provided faculty, students, and administrative personnel to meet their academic and administrative program needs?

2.3 Are budget allocations for the acquisition and the ongoing operations of information technology resources services sufficient to support the academic and administrative programs and are they consistently maintained from year to year?

Guideline #3: Availability of Resources

Software and hardware resources are readily available on campus, and where needed off campus, for use by the institution's academic community and its administrative units.

3.1 Do the operating hours of the campus computing centers and computing laboratories provide convenient access to faculty and students from both on- and off-campus locations?

3.2 Where off-campus resources are used as part of the institution's programs, are students and faculty provided convenient access to these resources?

3.3 Does a training program in the use of information technology resources exist for the benefit of students, faculty, and staff, including students in continuing education and off-campus programs?

3.4 Are there policies and procedures to ensure the integrity and security of information used by faculty, students, and administrators?

Guideline #4: Network Access

The telecommunications network capabilities are appropriate to provide faculty, students, and staff convenient access to information resources on and off campus.

4.1 Is there a campuswide telecommunications plan for voice, data, and video?

4.2 Is the networking access to on-campus information technology resources convenient to faculty, staff, and students?

4.3 Is there appropriate access to external information technology resources for faculty, students, and staff?

4.4 Are sufficient resources (staff, budget, equipment, and facilities) available for the support of telecommunications?

Guideline #5: Facilities

The current and planned facilities for information technology resources and services are adequate in quantity and quality.

5.1 Are the campuswide computing/telecommunications centers and computing laboratories appropriate for the academic and administrative programs and nature of the institution?

5.2 Does campus space/facilities planning incorporate the needs and standards for information technology resources and services?

Guideline #6: Institutional Uses

The institutional environment encourages faculty and staff to make appropriate and innovative uses of information technology resources to improve academic and administrative programs.

6.1 Does the institution's mission articulate the role and degree of importance information technology resources play in its academic and administrative programs?

6.2 Are policies, procedures, and incentives in place to encourage faculty to make appropriate and innovative uses of information technology resources to improve the academic program?

6.3 Are policies and procedures in place to encourage administrative staff to make appropriate and innovative uses of information technology resources to improve the operation, management, and decision making of the institution?

Development of these Guidelines

The idea for developing guidelines that might be used by accrediting agencies in evaluating information technology resources on college and university campuses was first proposed to CAUSE and EDUCOM by Robert G. Gillespie. At the time, Mr. Gillespie was Vice Provost for Computing at the University of Washington, and his idea grew out of his experiences serving on several accrediting committees for the Western Association of Schools and Colleges. He had also drafted material on computing for the revised handbook on accreditation for WASC.

The idea began to take shape with the appointment in December 1986 of two CAUSE Board members—David L. Smallen, Director of Information Technology Services and Institutional Research at Hamilton College in Clinton, New York, and Thomas W. West, Assistant Vice Chancellor for Computing and Communications Resources for The California State University System—to work on an ad-hoc basis with similarly appointed EDUCOM representatives—James Moss, Director of Computing Services at the Naval Academy, and Dr. Smallen, who represented EDUCOM as well as CAUSE because of his concurrent service on the EDUCOM Board, with Mr. Gillespie as a member at large. This joint committee worked on the guidelines for more than a year, during which time the notion was expanded to include the use of the guidelines not only for accreditation but also for self-evaluation, which in the end emerged as a primary purpose.

When the committee had worked out an explanation of how the guidelines might be used and an explanation of the accreditation process, the final draft of the document was approved by both the EDUCOM Board of Trustees and the CAUSE Board of Directors in the spring of 1988. CAUSE and EDUCOM gratefully acknowledge the creativity and working contribution of all the above-named individuals toward making these guidelines a reality.

These guidelines are reprinted here with permission from CAUSE and EDUCOM. CAUSE is a nonprofit professional association whose mission is to enhance the administration and delivery of higher education through the effective management and use of information technology in colleges and universities, and to help individual members develop as professionals in the field of information technology management in higher education. EDUCOM is a nonprofit consortium of higher education institutions which facilitates the introduction, use, access to, and management of information resources in teaching, learning, scholarship, and research. Since the publication of these guidelines, CAUSE and EDUCOM have been joined by the Association of Research Libraries in the creation of the Higher Education Information Resources Alliance (HEIRAlliance), which plans to undertake a revision of these guidelines in 1994 to recognize the increasing importance of networking information resources and its impact on academic libraries.

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APPENDIX C:
SAMPLE STATEMENTS OF MISSION, VALUES, PURPOSE‡

MIAMI-DADE COMMUNITY COLLEGE COMPUTER SERVICES DEPARTMENT MISSION STATEMENT

Computer Services operates as a primary service provider for computing resources at the College. Presently, this consists of all activities that connect with or access the mainframe computer and, to a growing extent, PC-based applications. The intent of Computer Services is to be a utility which provides analysis and programming services; computing power; software, hardware, and network support; and asset management for the College. The objective is to facilitate, promote, and encourage the use of computing as a tool to improve everyday situations for students, faculty and staff. The goal is to provide easy, timely, and accurate access to information for the purposes of improving all aspects of teaching/learning, decision-making, student assistance, compliance requirements, and financial management.

Our organizational value structure is founded on these beliefs:

- We regard quality service to our customers as critical.
- We believe that resources make things possible, but that people make things happen.
- We recognize teaching/learning as the central reality for the College and prioritize all activities accordingly.
- We value the sharing of information, expertise, decision-making, and ideas so that all people have a stake in events.
- We strive to optimize the use of resources in cost-effective ways.
- We treat all people with honesty and with consistent respect of their contributions, capabilities, and knowledge.
- We communicate openly and consistently.
- We believe in working together in effective teams.
- We always seek to improve all areas of our responsibility.
- We concentrate on solving immediate problems and learning to eliminate repetitive problems.

Our day-to-day goals and objectives are accomplished as follows:

- Computer Services provides computer and network-related services to student, faculty, and administrative departments on a College-wide basis. Hardware and software are consistently managed to help sustain accurate, timely, and innovative systems. We develop new systems using a structured systems development methodology, assuring that specific user needs are identified and met as accurately as possible. We maintain a broad inventory of systems designed to enhance student flow through the Miami-Dade system and to support diverse areas needing administrative support, such as institutional research activities, business records, library functions, and other areas. We also provide connection advice and administration.

- Operational support for computer and network-related services is provided for five campuses and several outreach centers through a main computer center and, presently, two satellite computer centers. The main computer center serves the College 24 hours a day, at least six days a week. Our major operations responsibilities are to troubleshoot operational problems; provide network support; supply systems programming; evaluate hardware and software capacity, performance, and utilization; support communications software; distribute computer-generated reports; furnish environmental conditions for proper physical and intangible requirements; and maintain computer terminals and associated equipment.

- Computer Services also coordinates activities with other college areas that are technology-related. One example lies in the planning and development of the college-wide network.

- Ancillary responsibilities include dealing with legal requirements, financial arrangements, backup procedures, standards-setting and compliance, documentation activities, and audit needs.

‡All of the statements included in this appendix are reprinted with permission from the respective institutions.

The Washington Community And Technical Colleges' Communications Technology Center Vision, Mission, and Purpose Statements

Vision for Communications Technology

Support: Communications technology will be a primary resource for students, employees, and other constituents needing access to data and information. Data and information will be accessible *when most convenient, from any location,* and *will be in a form that best meets the intended uses.*

Delivery of Instruction: Communications Technology will be a primary resource for learner-centered delivery of education and training. Education and training will be available *when most convenient to the student and employee, at any location* (home, workplace and traditional classrooms), and *will be in a form that best matches learning styles.*

Communications Technology Center Mission

The Communications Technology Center provides communications technology leadership and assistance to higher education institutions in support of their missions.

Communications Technology Center Purpose

- Provide leadership and planning assistance for higher education institutions in the application of communications technology in support of their missions.
- Plan, acquire or develop, install, and support common administrative software applications.
- Provide assistance to the institutions for their acquisition, implementation, and support of unique, self-support software applications.
- Assist institutions in computer hardware planning, acquisition, installation, and support.
- Assist institutions in telecommunications network planning, acquisition, installation, and support within and between campuses and with other external networks.
- Assist institutions in planning, acquisition or development, installation, and support of software for use in instructional programs.
- Assist institutions in video telecommunications program planning, acquisition, development, and support for their telecourse distance education, in-service training, and video conferencing needs.
- Research and evaluate communication technologies for use by the institution.

Key Term Definitions:

Support: This activity includes day-to-day problem solving/ trouble shooting and user training.

Communications Technologies: Includes computer, data and video telecommunications, and software technologies and their support.

College of DuPage Computing and Information Systems Mission Statement

Computing and Information Systems will provide the highest quality computing and data networking services, in the most cost effective manner, to facilitate the management, teaching, and learning processes at the College of DuPage.

To accomplish this mission we will:

- Promote and facilitate the effective integration of computing into the basic mission of the College through planning, programming, training, consulting, and other support activities.
- Develop, enhance, and manage the college's computing networks to provide high-speed, transparent, and highly functional connectivity among all computing and information resources.
- Develop and maintain highly effective, reliable, secure, and innovative information systems to support academic, administrative, and research functions.
- Promote new uses of information technology within the institution through the support for exploratory and innovative applications.
- Participate in the planning, designing, implementation and operation of institutional computing resources, including computer labs, and faculty work areas.

Maricopa Community Colleges: Shared Values of Information Technologies Services

The members of the Information Technologies Services department have spent a great deal of time and thought, using Total Quality Management techniques, in the development of a department-wide statement of values and statement of purpose. Over the next few months, personal and professional mission and value statements will also be developed for each individual member of ITS. These mission and value statements are the basic tenets by which we will manage the enterprise and are our best predictions of what is to come.

ITS Statement of Values

We all share these values as we work to accomplish our mission.

- Quality service to our customers is our primary goal.
- We believe that assets make things possible, but people make things happen.
- We treat all people with honesty and respect, and strive to eliminate fear in the workplace.
- We communicate openly and consistently.
- We believe in working in teams.
- We always aim for continuous improvement.

We value the sharing of information, expertise, successes and failures, decision-making, ideas, and our friendships.

We value working together through achievements and disappointments. We acknowledge and respect the diverse talents of each other. We appreciate the differences among us and we commit to affirmative action. We value high personal ethics.

We support leadership at all levels and we will provide the opportunities for growth so that leadership may be developed throughout the organization. Each of us will accept leadership responsibilities as they are presented to us.

We value forward thinking that fosters innovation, creativity, entrepreneurship, risk taking, initiatives, questioning, new viewpoints, and interesting failure.

We support the ongoing training and education of ourselves and our colleagues throughout the district. We will provide a learning environment in order to improve and update each other. We welcome the challenges associated with growth.

We take pride in a job well done. We maintain positive attitudes even when dealing with negative events.

We set realistic goals and make every effort to achieve them. We practice consistency and common sense.

We value open communications. We listen to our customers and learn from their feedback for our improvement. We work hard at keeping others informed and use a variety of communication methods.

We enjoy what we do. We celebrate successes and learn from failures. We believe in humor and fun in the workplace. We give rewards and acknowledgments on an ongoing basis.

We value a close working relationship with our customers. We value promptness and responsiveness. We are committed to customer satisfaction.

ITS Statement of Purpose

The purpose of Information Technologies Services is to enhance Maricopa's mission of effective teaching and learning through the application of communications, computing, and library technologies.

We seek first to understand our customers, so that we may provide quality services that make the best use of all Maricopa's resources.

We are a technology services organization for our customers, the students, colleges, and people of the Community College District. By facilitating, supporting, and encouraging the appropriate use of technology, we improve the daily life of our customer.

We promote effective leadership and excellence in management of technology resources and systems.

We communicate effectively by listening, using open communication, sharing ideas utilizing electronic means, creating feedback loops, and accepting the responsibility of staying informed.

We encourage innovation by developing and acquiring new software, by evaluating new hardware, by accessing worldwide information resources, by being a catalyst for change, by focusing on the most important issues, and by supporting collaborative efforts.

We plan and work effectively in order to solve the "business problems" of our customers.

We provide for easy and timely access to accurate information that can be interpreted for the purposes of decision-making, compliance requirements, and student learning.

We ensure that access to technology is in easy reach of every customer.

We practice team work among ourselves and among others within the District. We educate and train our customers in the current and future uses of technology with the intent of making them self-sufficient and empowered.

We build information architectures that support data for long-term needs, automate business processes, eliminate duplicative efforts, assist in the reengineering of paper flow processes, and facilitate change.

We believe in quality as a way of life, illustrated by our attempts to create a model of excellence, to provide efficient solutions, to measure our efforts, to simplify systems, and to delight our customers.

We work to be cost effective by looking for cost reductions, by optimizing current investments, by supporting fund raising activities, by increasing our purchasing power, by utilizing technology, and by proposing efficient solutions to business problems.

We seek alliances with other colleges, technology vendors, government agencies, local businesses, and citizens of our community.

Chemeketa Community College Vision, Mission, and Values Statement

IT GROUP MISSION STATEMENT:

"The Information Technology Group provides unified services to *encourage, empower, and support* the college community in the effective use of technology."

The IT Group has aligned its vision, mission, and values with those of the College.

CHEMEKETA VISION:

Chemeketa is a dynamic community of learners and innovators. Undaunted by limitations, we seek to improve the quality of life for individuals, our community, and the world.

CHEMEKETA MISSION:

Chemeketa Community College's mission is to empower through intellectual growth, meaningful career preparation and advancement, and enhanced personal effectiveness.

CHEMEKETA VALUES:

Responsive:	We are a catalyst for community action.We respond with enthusiasm and optimism to opportunities for positive change.
Effective:	We develop and use effective approaches to learning and leading. We continually look for ways to improve the quality of our programs and services.
Caring:	We create and sustain a climate of caring and respect for all members of our community. We celebrate our differences as well as our similarities.
Collaborative:	We seek resourceful and cooperative solutions in partnership with others in our communities.
Creative:	We are innovative in our daily operations and our planning. We find ways to break down barriers and create pathways to success.

The Washington Community And Technical Colleges' Communications Technology Center: Statements of People and Organizational Architecture

People Architecture

"Those characteristics about human nature which allow people to perform at the highest levels and to be satisfied with their jobs."

- Feeling of pride in their organization.
- Opportunities for professional development.
- Desire to receive a full day's pay for a full day's work.
- Desire to have balance between their professional life and their personal life.
- Desire to be treated in a professional manner in the workplace.
- Desire to know how their job responsibility "fits" with the vision, mission, and goals of the organization.
- Desire to know that what they do is important.
- Feeling of ownership and control over how their job functions are performed.
- Opportunities to influence the design and implementation of all "support" processes or products they are to use in carrying out job functions.
- Desire to have easy-to-use, intuitive processes and tools to help perform job functions — to be self-sufficient.
- Access to the data and information they need whenever they need it from wherever they are located.
- Desire to have "in time" communications with their co-workers and the people they serve.

Organizational Architecture

"Those characteristics about an organization that allows it to be the best in the business."

- A clear vision, mission, and business purpose.
- Success through competitive or comparative advantage.
- Loyal employees.
- Employees who are satisfied with their jobs.
- Employees who perform at the highest possible levels.
- Professional, comfortable, and secure office workplace.
- "Customer-oriented" culture.
- Effective vertical and horizontal communications.
- Products or services that are high quality, low cost, reliable, and responsive to customer and employee needs.
- Good decisions by employees who are the closest to the people they serve or support.
- Employees who perform well in work groups.
- Employees who freely share data and information.
- Employees who have easy access to the data they need to effectively carry out their job functions.
- Employees who have the best possible "tools" for carrying out their job functions.

College of DuPage Computing and Information System "Tenets"

Each of us as employees must uphold certain values or "tenets" in order to build an effective service organization while focusing on our service to the computing user. The following tenets embody the "spirit" or "culture" of our organization.

- Our primary orientation is to provide excellent service to the college community in support of all computing activities.
- Our standard for individual and organizational performance is excellence. Excellence is defined as superior performance in relation to accuracy, timeliness, consistency, dependability, reliability, punctuality, objectivity, job knowledge, and professionalism.
- Our foundation is built on information technology; understanding and appreciating that technology is the core to our success. To that end, all staff are expected to actively pursue avenues to extend their knowledge of new technology in application to their work, and to share that knowledge with co-workers and other staff members of the college community.
- Our attitude should be characterized by respect, helpfulness, sharing, tolerance, flexibility, openness, honesty, courtesy, and good humor. Disagreement is inevitable; our challenge is to use it as a dynamic, positive force in our work.
- Each individual staff member is key to our success and is responsible for the reputation of the department.
- Each of us represents the department, and we should strive to present a unified, cooperative representation to those we serve. Teamwork and cooperation are essential.
- Each of us will "own" the problems we encounter until they have been resolved.
- Each staff member must monitor his or her own well-being, and strive for a pace and routine of activity that will maximize productivity and minimize stress. We must do our best to respect each individual's needs in this area.
- Each of us has an obligation to support and abide by the legal and ethical standards that apply to information processing, including copyright laws and rights of authorship, confidentiality, and privacy. We will share in protecting this information.
- Each of us should strive for professionalism in our appearance and relationships with the college community, our business associates, and our colleagues at other institutions.

Appendix D: Strategic Principles and Success Factors

The Washington Community and Technical Colleges' Communications Technology Center: Administrative Software Critical Success Factors

1. The rate of increase in technology costs is less than the rate of increase in employee work load—productivity measure.
2. Leverage oganization's current investments in hardware, software, and networks.
3. Direct support for students, faculty, instruction, administrators, and staff.
4. Maintenance of CTC's price performance margin in higher education.
5. Implementation of systems on time and within budget.
6. Significant reduction in users' "shadow" systems.
7. Ease of systems' use for frequent and infrequent users.
8. Ease of tailoring system features to user needs.
9. Significant reduction in system defects.
10. Significant reduction in system maintenance efforts and costs.
11. Ease of keeping system current with user needs by replacing or enhancing *modules* rather than the *entire enterprise-wide systems.*
12. Ease of integrating new technologies as they become available.
13. Prevalence of user's belief in ownership and control of systems.
14. Use of college students, faculty, and employees as "leveraged" resources for developing and supporting software.
15. Ease of systems support for colleges' Total Quality Management.
16. Ease of systems use with various computer platforms, database management systems, and end-user tools.
17. Level of self-sufficiency of users.
18. Level of reusability of software modules, documentation, training media, and problem solutions.

Maricopa Community Colleges Information Technology Services Strategic Principles

Learner-Centered Principles

PRINCIPLE 1
Distance learning, alternative instructional delivery systems, and computer augmented instruction are expected and demanded by our learners. ITS must implement the technology and networking infrastructure to provide these forms of instruction.

PRINCIPLE 2
ITS must provide support to the learners by implementing tool kits and networking infrastructure to support learner-owned computing and communication systems from home and in classrooms/laboratories on campus.

PRINCIPLE 3
ITS must negotiate with technology vendors and financial institutions to organize and provide low-cost, personal purchasing programs for learners.

Technology-Centered Principles

PRINCIPLE 4
The network must be the cornerstone technology of the 90s and must receive major investments of support by ITS.

PRINCIPLE 5
ITS must lead library and information literacy efforts so that these efforts may be at the center of the teaching and learning process.

PRINCIPLE 6
Our information technology (hardware and software) architecture must include only products that are consistent with the major standards criteria and industry directions.

PRINCIPLE 7
ITS must use a variety of strategies, including development of strategic alliances with other educational organizations, to

support the implementation of a new generation of institutional management software that will integrate the major institutional functions.

PRINCIPLE 8
Information is viewed as a critical resource and quality data management processes must be applied to this resource.

PRINCIPLE 9
ITS must leverage existing resources through a philosophy of reuse before building, creating a clearinghouse for district-wide developments and promotion of information dissemination.

PRINCIPLE 10
ITS must facilitate the use of technology rather than attempting to control or dictate the use of technology.

Reengineering Principles

PRINCIPLE 11
Using cross functional teams and TQM techniques and processes, ITS must facilitate the reengineering of the business processes of Maricopa (i. e. , registration, awarding of financial aid, payroll, ways of offering instruction) to align them with customer (student/employee) needs.

PRINCIPLE 12
The new hardware and software architectures must be planned through a participative process in which the appropriate technology is matched to the "business problem," the culture and new organizational dynamics.

PRINCIPLE 13
ITS must look to creative funding alternatives to finance the technology needs of Maricopa. Bond drives, fees, business alliances, grants, outsourcing, privatization, and other cost effective alternatives will be explored.

Faculty/Staff-Centered Principles

PRINCIPLE 14
ITS must provide support to faculty and staff by developing and making tool kits available that give faculty and staff access to information they require to adequately perform their jobs.

PRINCIPLE 15
ITS must provide technical and operational support for a variety of training activities so that the knowledge base of the employees within Maricopa can keep pace with the rapidly changing technological environment.

PRINCIPLE 16
ITS must provide the infrastructure and support for the use of electronic communications of all kinds (i.e., mail, conferencing, electronic document interchange, and imaging).

Organizational Principles

PRINCIPLE 17
ITS must establish itself as a learning organization.

PRINCIPLE 18
ITS must restructure itself organizationally for the new information technology era, establishing new roles, where required, for individuals within the organization.

PRINCIPLE 19
ITS must reengineer its own internal processes and methods of providing customer services using TQM techniques.

PRINCIPLE 20
ITS must establish clear communication channels for resolving problems and for feedback to and from our owner communities.

Sample Principle Statement with Driving and Restraining Forces and Implications:

PRINCIPLE 4
The network must be the cornerstone technology of the 90s and must receive major investments of support by ITS.

Driving Forces:

- The key activity of the future is people communicating with others and other information resources.
- A distributed learning environment requires networking.
- Effective institutional management of a geographically dispersed system needs the capability of communicating within itself and with many other institutions.
- Network delivered education may be provided at a lower cost per student than more traditional approaches.

Restraining Forces:

- Networking standards must be established so that consistent and effective communication can take place. Such standards may, necessarily, infringe upon freedom of choice in the selection of hardware/software products by departments and colleges.

- Networking is still a relatively new technological field without readily available diagnostic and management tools.

- Networking infrastructure, including cable plant and hardware/software components, are not visually apparent to the end user of a system, thus making it difficult to justify to some the significant costs that must be paid for such infrastructure.

- Current ITS and college technical staffs are not as knowledgeable about networking as they need to be; additional and ongoing training is required.

- Current internal networks and external network connections do not have redundancy, alternative routing or other mechanisms that will guarantee 100% availability to users.

Implications:

- Network maintenance and redundancy must be addressed and provided.

- Demand for information locally and access to databases located throughout the world will continue to increase and it will be difficult, if not impossible, to keep up with the demand.

- Telecommuting, whether for work or for learning, requires information technology in the home. There is a great potential that there will be students who cannot afford to purchase such technology.

- MCCCD must find creative funding sources to support the ongoing expansion and improvements to the network(s).

- Investment in internal networks and external network connections may make it possible to eliminate the need for additional buildings and more traditional expenses associated with traditional college campuses.

- MCCCD will need to make certain that we retain equal access opportunities for all students to access information services.

- Expanded network access will require additional attention being paid to network security and overall network management.

- The MCCCD network must be upgraded to take advantage of the National Information Infrastructure for new instructional opportunities.

- Network expansion will lead to additional ITS systems development as other organizations connect to the MCCCD network.

Company Profile

IBM is a federation of companies whose business is providing advanced information technologies, services, and products. Its principal businesses—marketing and services organizations and an array of manufacturing and development units—represent the industry's broadest spectrum of expertise and technologies.

Involvement in Higher Education

Since its earliest years, IBM has supported colleges and universities through contributions of dollars and equipment. These contributions are intended to encourage excellence and creativity, to help higher education attract and retain faculty, conduct research, initiate new and leading-edge curricula, and provide efficient administrative support to faculty and students. IBM provides support through involvement of its people through the faculty loan program. Additionally, IBM is involved with universities worldwide in many collaborative research projects.

In support of IBM's commitment to higher education, Academic Information Systems (ACIS) was formed in 1983 to be the corporate focal point for higher education. ACIS's goal is to help colleges and universities enhance the quality of education through the use of technology that meets the needs of faculty, students, researchers, administrators, and librarians.

Products and Services

IBM provides a broad family of advanced technology systems for the implementation of administrative and library applications. Product lines such as the ES/9000™, AS/400®, RISC System/6000™, and Personal System/2™ are supported with a wide array of alternatives and approaches to new information systems. Rapidly emerging technologies supported by these product lines include image processing, voice response, and client/server architecture.

Academic Consulting and Services, a new organization within ACIS, consists of Academic Consultants and Specialists with higher education experience in management and functional consulting, as well as implementation services. ACIS helps institutions coordinate and integrate their information processes campus-wide, to ensure efficiency and help maximize technology investments.

ACIS Consulting and Services offerings focus on the following areas:

- **Information Strategy and Planning** — This methodology identifies requirements for information technology, resource allocations, selection of platforms, project planning, and setting strategic, academic, and research computing directions. ACIS consultants and specialists will help accelerate decision processes, facilitate executive commitment, and reduce the political problems that may impede the implementation process.

- **Administrative Strategy and Implementation** — ACIS consultants can assist the client institution in maximizing information access within its administrative information support systems. The consultants' expertise includes assistance in selection of information support systems for student, financial, human resource, and alumni development. In addition, they can assist in the planning process for the structure of administrative support systems, including providing current industry direction, administrative information systems issues and trends, and assessment of users' requirements.

- **Business Process Reengineering** — Analysis of work flow processes, information organization structure, and marketing and recruitment strategies are vital to

the success of business processes. ACIS consultants will help implement Total Quality Management (TQM) principles that improve those processes. IBM will create a detailed plan for business process reengineering, staff training, reorganization, software customization, and changes in work flow.

- **Libraries and Museums** — The electronic library and museum are defining information access on campus. ACIS consultants will provide expertise in applying technology such as multimedia interfaces and image databases to a campus-wide information access strategy. ACIS consultants can provide technology trend analysis and project planning and assessment.

- **Instructional Services** — The electronic classroom is here, and IBM can help design and implement it to individual specifications. ACIS consultants can help design courseware that facilitates an interactive teaching style and helps train faculty. IBM can also provide services in niche areas such as remediation, computer-integrated manufacturing, and more.

- **Research Technologies** — Research consulting and services help clients apply research methods and advanced computing technologies to the problems of physical, natural, and social sciences. Included are services such as rightsizing analysis, design and implementation of mathematical and analytical computing systems, and project planning and technology assessment.

- **Networking Technologies** — Networking technologies specialists help campuses develop and expand network services to faculty, students, researchers, administrators, and librarians in an open computing environment. ACIS specialists can help design physical and logical networks, conduct requirements analyses, and design and implement decision-support tools.

In addition, IBM offers—through its subsidiary, the Integrated Systems Solution Corporation (ISSC)—a wide range of systems integration services, total service and applications, or function-specific solutions. Specific ISSC offerings include total outsourcing of computer and data services as well as development of a business recovery plan in the unlikely event of a disaster.

Business Partners

IBM has entered into business partnerships with the industry's leading suppliers of high quality application software and support services for library and administrative applications. These business partners offer best-of-breed applications in all areas of higher education computing.

For more information about IBM and ACIS, their products, services, and programs, contact your local IBM office, or write to:

IBM Academic Information Systems
501 Merritt 7 Corporate Park
Norwalk, Connecticut 06851

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CAUSE is a nonprofit professional association dedicated to enhancing the administration and delivery of higher education through effective management and use of information technology, and to helping individual member representatives develop as professionals in the field of information technology management in higher education. Incorporated in 1971, CAUSE serves its membership of nearly 1,200 campuses and 3,200 individuals from its headquarters at 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301. For information phone 303-449-4430, send electronic mail to INFO@CAUSE.COLORADO.EDU, or access the CAUSE Gopher server at CAUSE-GOPHER.COLORADO.EDU, port 70.

CAUSE is an Equal Opportunity Employer and is dedicated to a policy that fosters mutual respect and equality for all persons. The association will take affirmative action to ensure that it does not discriminate on the basis of age, color, religion, creed, disability, marital status, veteran status, national origin, race, sex, or sexual orientation, and encourages members and other participants in CAUSE-related activities to respect this policy.

The League for Innovation in the Community College is a nonprofit educational consortium of resourceful community colleges organized to stimulate experimentation and innovation in all areas of community college development. Founded in 1968, the League seeks to serve as a catalyst, project incubator, and experimental laboratory for community colleges throughout the United States and Canada. The League office is located at 26522 La Alameda, Suite 370, Mission Viejo, California 92691; phone 714-367-2884; fax 714-367-2885.

Membership in the organization is kept small to allow the League to function as an effective working group of colleges. The League combines the advantages of a small effective working group with critical mass—the League's eighteen member districts include forty-six public institutions located in fourteen states and one Canadian province, enroll nearly 500,000 students, and employ over 20,000 faculty and staff.

The League is committed to sharing the results of its efforts with all community colleges. Its programs and conferences are open to staff from all colleges, and its publications are disseminated to every community college in the United States and Canada. The League regularly includes community colleges from throughout North America in its projects and invites collaboration with all organizations committed to improving community college education.